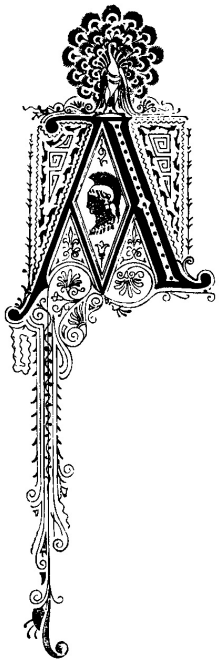


As Vanessa Collingridge states in her chapter "'The thing which is not': Mapping the Fantastic History of the Great Southern Continent" (in *New Directions in Travel Writing Studies* pp 163-179), the 'empty' space of the conjectured "Great Southern Continent" - *Terra Australis*, or more correctly, *Terra Australis nandum congnita*: the 'South Land not yet known' is the focus of this monograph. As its curious label suggests, this land was a putative antipodal space, first debated and described by classical authors from Pythagoras to Plato and Cicero, and 'mapped' on paper and in the mind, despite the fact that no one had ever travelled there - or according to Aristotelian geography could travel there, as it lay conceptually beyond the impassable torrid zone at the equator. And yet the fabled continent became a geographical meme, carrying its own recognizable intellectual tradition and even physical form containing detailed coastline, rivers, place-names, and sometimes its own civilizations.

And as Avan Judd Stallard states in the highly recommended book *Antipodes, In Search of the Southern Continent,* the mythical southern continent has always loomed as one of the most intriguing and most significant imaginative geographies of the recent past. Anyone with a passing interest in early modern cartography will have seen it at the bottom of ornate Renaissance maps: enormous, elusive and transfixing. The continent's list of names and guises suggests a pedigree that spans multiple ages and empires: the *Antipodes, Magellanica, Beach*, the *Great South Land, Austrialia del Espiritu Santo, Gonneville Land, Jave la Grande, Terra Australis*, and the list goes on. In its various iterations, the mythical southern continent has been the single most potent receptacle for European geographical expectation about the southern hemisphere, and one of the shaping forces of early modern history. It pushed men to the farthest reaches of the earth in search of fame, riches, kingdoms, souls, and ultimately truth, in the process revealing worlds hitherto unimagined.

Antarctica was the last region on earth to be discovered, technically unseen until 1820 when the Russian expedition of Fabian Gottlieb von Bellingshausen and Mikhail Lazarev on Vostok and Mirny sighted the Fimbul ice shelf. The continent remained largely neglected for the rest of the 19th century because of its harsh environment, lack of easily accessible resources, and isolation. In January 1840, land at Antarctica was discovered for the first time, almost simultaneously, by the United States Exploring Expedition, under Lieutenant Charles Wilkes, and a separate French expedition under Jules Dumont d'Urville. The latter made a temporary landing; while the Wilkes expedition, though it did not make a landing, did remain long enough in the region to survey and map some 800 miles of the continent. The first confirmed landing was by a team of Norwegians in 1895. And yet, as can be seen herein, the fact that no one had see, let alone mapped, this large landmass never stopped cartographers from ancient times to speculate what this southern continent looked like.

That the world is round was well-known to Greek philosophers and geographers several centuries B.C. They termed the North Polar region the Arctic after the constellation *Arktos*, the Bear, located in the sky above; and used the name *Antarktikos* to denote that region which lay opposite the Arctic. Understanding that

the world rotated on an axis, the Greeks also speculated that there must be an equivalent landmass in the southern hemisphere that served to balance the weight of the (known) lands in the northern hemisphere. This balancing weight helped to maintain the equilibrium of the rotation, preventing the earth spinning wildly off its axis.

The standard historical view is that the Greeks subscribed to a notion of "cosmographic symmetry". Symmetry in ancient Greek times would entail the presence of either two or four landmasses: either an additional antipodal landmass on the opposite side of the globe to the *oikoumene* [the known inhabited earth], or a landmass in each quadrant of the globe. Alongside this notion stands the equally popular explanation of "hemispheric balance", or what is referred to in Stallard's book as "the theory of equipoisure": a southern landmass was postulated because philosophers believed the earth would be imbalanced without a counter to the *oikoumene*. That is, the land-heavy north would topple over without an equally land-heavy south.

Modern representations (not reconstructions) of what a Cratesian map or globe might have looked like are now commonplace *(see monograph #113)*. To the best of knowledge, the Greek Crates only posited three landmasses on the sphere, and when it comes to their specific location all that is said is that there is one landmass (the *oikoumene*) in the northern temperate zone, and two landmasses in the southern temperate zone. There is no indication of how far apart the latter two landmasses are, their configuration, size, shape and so on. We know almost nothing. If one was to map this cosmography it might look like something austere and should be clearly labeled as an original production, not as an actual reproduction of a globe produced by Crates about which nothing is known. Yet modern authors have ventured much more compelling maps than is justified, intimating very specific knowledge about Crates' cosmography that simply does not exist. Consider an elegant drawing that presents a system of oceans and lands that look to be symmetrical, and includes a fourth continent. Such representations of Crates' globe have taken a lot of the attention away from the only existing evidence of Crates' cosmography, which is strictly limited to written texts.

The present ubiquity of these elegant but speculative maps accompanied by elegant but unsubstantiated explanations is what makes Strabo's record of Crates' reasoning so valuable. Crates conjectured the *Antipodes* as a matter of literary fealty; his *Antipodes*, and at least one other southern landmass besides, were created in an act of Homeric interpretation. Crates conjectured it, other scholars adopted the idea, and throughout antiquity and the Middle Ages no scholar had need for, and no scholar expressed, theories of symmetry or *equipoisure*. It was perfectly adequate for each succeeding generation of scholars to perpetuate the idea of southern land on the basis of tradition and authority alone. How or why modern historians came to believe that ideas of symmetry and balance drove this conjecture is not clear. From the first century BC the concept of a "quadripartite cosmography" is evident (that is, a landmass in each of the four quadrants of the globe). Perhaps the symmetrical agreement of this cosmography led historians to mistakenly assume that a

commitment to symmetry was the actuating factor behind quadripartite cosmographies, thus misplacing effect as cause.

The first piece of the puzzle is establishing why ancient knowledge lasted till the early modern period, and why that knowledge was actively sought and used by the early moderns. While Crates originally proposed a concrete vision of peoples and lands, in the centuries that followed the question of southern hemispheric lands was treated as an open inquiry by most scholars. The *Antipodes* operated not as a place at that point in history, but a space: intangible, unknown, unknowable. Observe the comments of Cleomedes (thought to have written sometime between the first century BC and 44 AD) who posits other lands and other peoples on the basis of theory and reason:

> The theory of Nature teaches us that circumhabitants, antipodes, and contrahabitants must exist, since none of these are described by direct reports. We simply cannot travel to our circumhabitants because the Ocean separating us from them is unnavigable and infested by beasts; nor to the inhabitants of the contratemperate zone, since we cannot traverse the torrid zone. Yet the regions of the Earth that are equally temperate are necessarily inhabited to an equal extent, given that Nature loves Life, and Reason requires that all of the Earth, where possible, be filled with animal life, both rational and irrational. (1.1.262)

As is the case with a number of scholars, Cleomedes makes clear to his readers that antipodality is a normal and necessary fact of spherical geometry:

> Our antipodes become contrahabitants of our circumhabitants, since such relations resemble those of friends and brothers, rather than those of fathers and children, or slaves and masters; that is, they convert, in that we become circumhabitants of our circumhabitants, antipodes of our antipodes, and similarly contrahabitants of our contrahabitants. (1.1.209)

So Europeans are antipodeans, too. Indeed, we are all antipodeans to someone, a relativist concept that predates post-modernity by millennia.

Thus, long before human eyes ever beheld Antarctica, the ancients were convinced it existed – or at least something like it. Claudius Ptolemy *(#119),* a Greco-Roman astronomer who lived around 100 – 170 CE (AD), along with other Greek philosophers, thought that an enormous far-southern landmass must exist in order to provide the above-mentioned planetary counterweight to the large continents of the north. So, the earliest maps depict a great landmass in the southern hemisphere. The world map in Claudius Ptolemy's *Geographia*, is generally credited to Agathodaimon, a geographer active circa 250 A.D., and shows a land-locked Indian Ocean, with a great *Terra Australis* forming the southernmost rim. On the 1482 Ulm edition of Ptolemy this area is labeled '*terra incognita secu[n]du[m] ptholeum[m]* [unknown land according to Ptolemy]. However, Ptolemy believed that this region was warm and wealthy.

On top of this, many modern scholars contend that Ptolemy's concept of an enclosed Indian Ocean had a further long-term implication for cosmography and cartography, maintaining that his land bridge was the prototypical southern continent. These scholars believe that it is with this Ptolemaic land bridge that the southern continent finally gained magnitude, and, more importantly, gained through Ptolemy's writings a theoretical justification for its existence in the form of the theory of *equipoisure*. But, in actual fact, Ptolemy makes no allusions to *equipoisure* or related

concepts, and his so-called southern continent only has implied magnitude, given his geography is strictly limited to the *oikoumene*. A key element of Ptolemy's undertaking was to provide coordinates for regions to which he believed he possessed reliable information, and no other.

The consequence of this was that Ptolemy could not provide a complete cosmography. In sketching the limits of the *oikoumene* Ptolemy conceded that in parts of the north, south, east and west knowledge was incomplete, the borders constituted by "unknown land". The greatest gap in his knowledge was southern Africa (*Aithiopia*), but he nevertheless stipulated that a land bridge connected eastern Asia to southern Africa, thus enclosing the Indian Sea. He states that the Indian Sea is "contained by the *oikoumene*", with "land on all sides": "Asia is connected to *Libye* both by the land-strait at Arabia ... and by the unknown land that surrounds the Sea of India."

Ptolemy's world map in the Ulm edition, 1482

Does this vague southerly land bridge enclosing the Indian Ocean equate to a Ptolemaic southern continent? Certainly modern authors have treated it as such, but without justification. If you imagine this land bridge stretching deep into the southern hemisphere—as moderns are wont to do because of our knowledge of later depictions of the southern hemisphere—then it is a prototype of the early modern vision of the southern continent. This impression is encouraged by Ptolemaic maps *(maps interpreting Ptolemy's writings)*. However, like the reconstructed globes of Crates, no original Ptolemaic maps have passed down, and it is not even certain that Ptolemy ever actually created the sort of map that he describes in such detail. The maps by which Ptolemy is known are much later reproductions, and therein lies the problem.

Yes, even then most educated people believed in a spherical earth. The theory of the sphericity of the earth, first advanced by the Pythagoreans upon no basis other than their desire to attribute the perfect form, that is, the sphere, to the world they inhabited, was shown to be susceptible of proof by Aristotle. That theory once accepted, a corollary to it was soon formulated: in order that the equilibrium of the sphere be maintained it was a necessity of physics that there exist landmasses in the south and west to act as counterweights to the masses of the north and east which formed the *oikoumene* or inhabited world of Europe, Northern Africa, and Asia. These landmasses were the known as the *Antipodes*. Specifically the southern *Antipodes* became known as the *Antichthon*. That theory was of the most remarkable persistence, bridging not the centuries but the millenniums. It was seriously advanced in the late 18th century by the English geographer Alexander Dalrymple, and in the more than two thousand years intervening it had never been without its advocates.

It would take too long to recount the story of the controversies that clustered about the theory of the antipodal lands in the ancient world. Did they exist at all? What was their extent in relation to the water areas of the world? Were they habitable? Were they accessible? That the ancients did eventually hypothesize lands on the other side of the globe is, perhaps, surprising more for the late date at which it came than the fact they should have reached such a position. Based on contemporary knowledge, there were, after all, only three likely possibilities for the composition of the southern hemisphere: land, water, or land and water. The prospect of unknown lands carried the potential fascinations of new worlds; the prospect of endless seas promised nothing.

Those were the questions discussed by scientists, poets, and men of letters. Strabo *(#115)* and Pomponius Mela *(#116)* were among the geographers to whom its accessibility and habitability were matters of concern. Lucretius and Plutarch were opposed to the whole conception of the sphericity of the earth and were charged even in their time with having offered puerile objections to it. Cicero, on the other hand, in his *Dream of Scipio*, upheld the theory with intelligence and acumen. That fact is of particular importance because it was upon the basis of his comments that a whole cycle of maps, the *Macrobius* cycle *(#201),* was constructed in the European Middle Ages.

The chief and most violent opponents of the theory of the *Antipodes* were not, however, any group of men of the classical era, but the Fathers of the early Christian Church. The hatred of it expressed by Lactantius, for example, carried over almost with he force of dogma into the Middle Ages. Because of the rejection by their makers of the theory of sphericity those maps retained in essentials the form of the world as conceived by the Greeks of the Homeric age. There were, however, those who took exception to this position even among the churchmen. Saint Isidore of Seville *(#205)* conceded the probable existence of the southern *Antipodes* and upon the basis of a single sentence or two from his pen the *Beatus* cycle of maps *(#207)* portrayed for centuries an unknown continent south of Africa and the Indian Ocean.

The long controversy was settled so far as the western *Antipodes* were concerned when America was discovered and its great extent revealed. The desire to discover the southern *Antipodes*, the *Antichthon* of the ancients, became thereafter one of the impelling motives of exploration. The story of the origin and the persistence of the belief in that continent, of the controversies which grew out of that belief, of the centuries of exploration in search of the elusive shores of the *Terra Australis*, is one of

the most curiously interesting in the record of human thought and action. The maps in which the theory found delineation are a feature of much more than incidental interest.

This hypothetical region, which had never been seen much less mapped, even had names: The term "*Antarctic*," coined by Greek geographer Marinus of Tyre back in the second century CE, referred to an imagined area opposite the Arctic Circle; and in the fifth century, the Roman scholar Macrobius *(#201)* included a southern territory called *Australis* (Latin for "of the south") on his maps.

Here in a compressed statement is the notion of Isidore of Seville, churchman and saint, who indicated in his writings that he more than half believed in the sphericity of the earth and quite fully in the doctrine of the *Antipodes (#205).* Saint Isidore was not consistent in the affirmation of his adherence to the theory, but the sentence from his *Etymologiarum*, quoted below, was repeated so often by his successors that it became the formula through which those of the Middle Ages who accepted the existence of the *Antichthon* expressed their belief. The chief influence in keeping the theory alive in that period was the maps of the *Beatus* cycle, the earliest of which has just been described. In the *Beatus* map found in the Pierpont Morgan Library, one of the 13th century *(#207.24),* there appears upon the land strip south of the Indian Ocean a fuller statement that is recognized as a quotation, with some curious errors, of the essential passage from the *Etymologiarum* of Isidore of Seville. Transcribed that legend reads as follows:

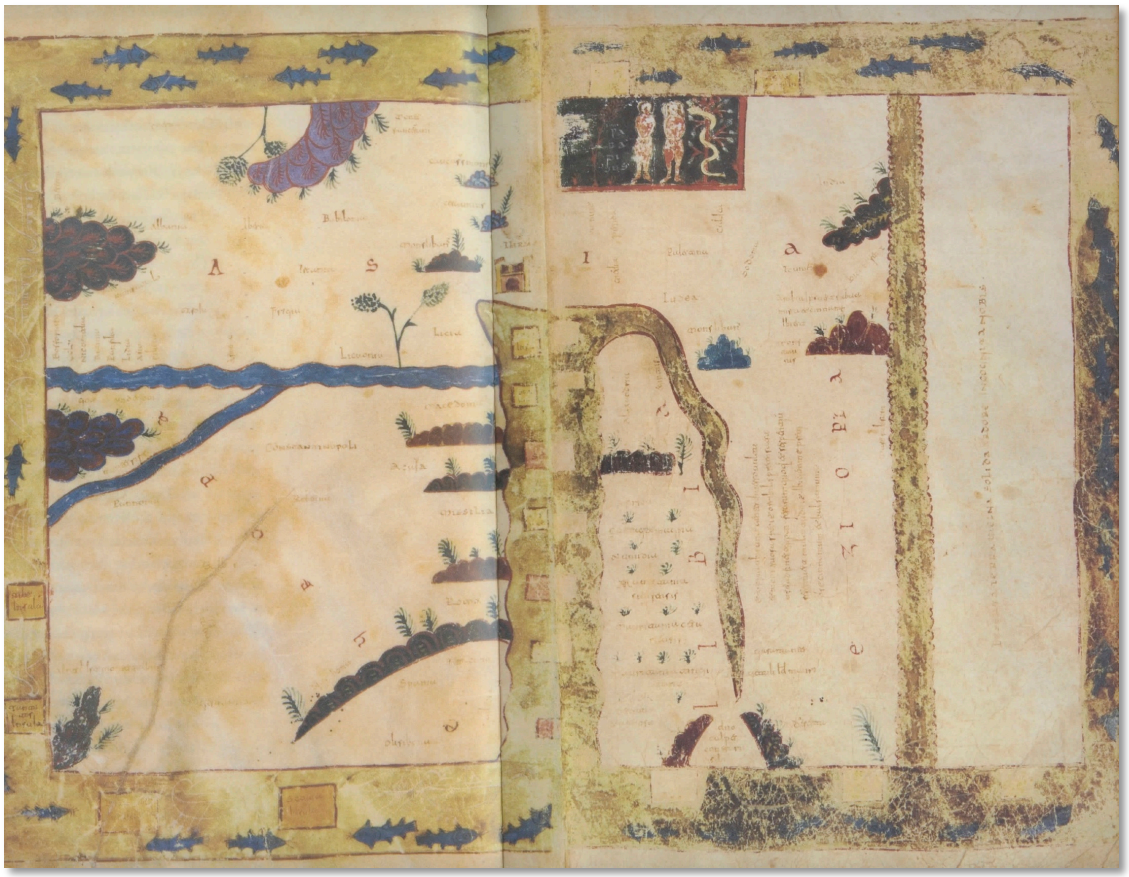
Extra tres autem partes orbis quarta pars trans oceanum interior est qui solijs ardore incognita nobis est culpis [sic] finibus anti podus [sic] fabulose inhabitare produntur.

A rough translation of the passage, corrected by the text of Isidore, results in the following statement:

Moreover beyond [these] three parts of the world, on the other side of the ocean is a fourth inland part in the south, which is unknown to us because of the heat of the sun, within the bounds of which the Antipodes are fabulously said to dwell.

Maps based upon another source joined with those of Beatus to keep alive the theory of a fourth continent lying to the south of the *oikoumene*. In his *Somnium Scipionis* and elsewhere Cicero makes clear his belief in the theory of the *Antichthon*. In the sixth century A.D. Macrobius, in his *In somnium Scipionis expositio*, a work of great popularity in the Middles Ages, carries further the statement of Cicero concerning the habitable character of the southern zone *(#201)*. He affirms, however, that reason alone permits us to assume its habitable character, for the intervening Torrid Zone prevents us from ever knowing what the truth of that matter may be. The 10th century circular map built upon the Macrobius exposition, and many which follow it from that source, form a cycle of cartographical documents in which a bowl-shaped continent at the south of the circle is described as *antipodal land* unknown to us, a concept not unlike that found upon modern maps drawn to embody the conjectures of Pomponius Mela *(#116).* More than one printed edition of Macrobius of the 15th century preserves this concept in its woodcut map. Thus the idea of the *Terra Australis* came to the Middle Ages with double authority, the belief in the theory expressed by St. Isidore of Seville, embodied graphically in the maps that accompanied certain manuscripts of the Beatus *Apocalypse*, and the acceptance of it by Cicero, transmitted by the commentary and map of Macrobius.

A manuscript on vellum Macrobius world map, 11th century, 12 cm diameter (#201)
North is at the top. The earth is divided into five zones, with the central zone (Perusta) unequally divided by the equatorial ocean. Italia and the Orcades are marked, along with the Caspian Sea, in the northern Temperate Zone (temperata nostra). The Red and Indian seas are shown as inlets of the equatorial ocean. The southern temperate zone is marked Temperata antoecorum (temperate zone of the antoikoi) and the Antarctic is labeled "Frigida Australis"



The first Beatus derivative map, by order of date, is known by several names: Escalada, Ashburnham, Morgan 644, Ashmolean, New York I, and/or Magius (the Ashburnham name is derived from one of its prior owners, G. Libri, the Earl of Ashburnham; the first name indicates its place of origin and the last its possible author, Maius/Magius). The curious dating of its parent manuscript, The Commentary of the Apocalypse by Beatus of Liébana (died 798), leaves it an open question as to whether it was written and illustrated in 894, 926 or 950-60 A.D. Oriented with East at the top, the landmass on the right is the Antichthon. This one of the most unusual features of this map, and is a characteristic of all Beatus maps, that is the existence of a southern continent, land representing the northern littoral of an austral continent. It is separated from Africa by a band of water, here labeled the Mare Rubrum. (#207.2)

Both the *Wolfenbüttel* and *Paris* manuscripts of the *Liber Floridus* by Lambert, Canon of St. Omer *(#217)* possess a complete *mappamundi*, together with a special and interesting addition. Raymond Beazley, in his three-volume study, *The Dawn of Modern Geography*, says of Lambert's *Liber floridus* that *"Nowhere else in medieval cartography do we find greater prominence assigned to the Unknown Southern Continent."* The map measures 30 cm x 43 cm, and appears on folios 69v-70r. Danielle Lecoq, in the most extended discussion of this particular map in the Lambert manuscripts, suggests that the map is innovative in the way it combines traditions. On the *Paris* manuscript, where this land occupies half of the circle of the earth, a long inscription defines this '*region of the south*' in terms not unlike those used on the *St. Sever - Beatus* map *(#207.13)*:

> . . . temperate in climate, but unknown to the sons of Adam, having nothing that belongs to our race. The Equatorial Sea [Mediterranean] which here divided the [great land masses or continents of the] world, was not visible to the human eye; for the full strength of the sun always heated it, and permitted no passage to, or from, this southern zone. In the latter, however, was a race of Antipodes (as some philosophers believed), wholly different from man, through the difference of regions and climates. For when we are scorched with heat, they are chilled with cold; and the northern stars, which we are permitted to discern, are entirely hidden from them . . . Days and nights they have one length; but the haste of the sun in the ending of the winter solstice causes them to suffer winter twice over.

Thus the idea of the *Terra Australis* came to the Middle Ages with double authority-the belief in the theory expressed by St. Isidore of Seville, embodied graphically in the maps that accompanied certain manuscripts of the Beatus Apocalypse, and the acceptance of it by Cicero, transmitted by the commentary and map of Macrobius.

This map, shown below, is the first to depict the *Antipodes* as separate from an Australian continent and other carefully distinguished regions, continents, and peoples. The *Antipodes* are insular and singular, and the bounded island is pictorially classed with other islands, yet it is impossible to determine its location; indeed, the *Antipode* "island" crosses between hemispheres, among cardinal points, and athwart oceans.

Although the explorations during the Renaissance launched a new paradigm in the realm of geographical representations, sanctioning the notion of a cartography that increasingly relied on empirical verification and accurate measurements, the *mappae mundi* of early modernity perpetuated the "enchanted thinking" of the Middle Ages by positing the existence of a fantastic southern continent, *Terra Australis Incognita*. On much acclaimed world maps such as those of Abraham Ortelius (1570) or Gerardus and Rumold Mercator (1569/1587), but also in the extraordinary or utopian voyages of early modernity (Joseph Hall, Gabriel de Foigny, Denis Veiras, etc.), the hypothetical continent occupied almost all the southern hemisphere, from the South Pole up to the level of Australia.

According to the analysis, there were two theoretical arguments inherited from ancient and medieval cartography that generated the chimera of *Terra Australis Incognita*: the theory of the *Antipodes*, which stated that a hypothetical continent was located in the southern hemisphere, symmetrically positioned in relation to the northern *oecumene* {known inhabited world], and the theory of isthmuses, which, based on the idea that the mass of earth was dominant in the world, claimed that the Indian Ocean was surrounded by a strip of land uniting Africa and Asia.

Unlike the Arctic region that presented a possibility of "short-cut" to the riches of Asia from Europe, Antarctica offered no such economical or commercial incentive to explore. Its discovery, exploration and development, from the start, has been more about scientific environmental research. And yet, as will be seen, cartographers from the 16th through the 18th century actually did a remarkable job of defining this southern continent in fairly accurate ways without any empirical evidence of its existence.

Zonal world map from Liber Floridus
(Herzog-August Bibliothek, Wolfenbüttel, Cod. Gud. Lat I, folios 69v-70r)
Lambert St Omer, 12th century 41.3 cm diameter (#217)

During this period empirical data was eagerly sought after, but it must be kept in mind that these early cartographers, cosmographers, raconteurs and entrepreneurs operated in a paradigm where conjecture and adherence to tradition was an accepted part of intellectual culture. That was, indeed, the very nature of the cosmographical enterprise: to extrapolate and postulate based on available empirical evidence combined with theory, tradition and desire. Where data was wanting, other forms of knowledge were sought and trusted. The rigid delineation between the verifiable and empirical on the one hand, and the conjectural and unfalsifiable on the other—so common and important in modern times— simply did not exist in earlier times.

The South Pole on the 1492 Behaim globe (#258).
Behaim did not want to speculate on the existence of the Southern Continent

Around the beginning of the 16th century, in the span of just a few decades, the *Antipodes* transitioned from a subject of occasional conjecture—as it had been throughout ancient and medieval times—to a geography proclaimed real. When Magellan discovered, during the first circumnavigation of the world, the strait that bears his name, he assumed that the islands to the left, towards the pole, were the protuberances of another continent, which the Renaissance geographers subsequently named *Terra Australe Magallanica, Brasilia Regio, Brasilia inferior, Papagalli Terra*, etc. Based on the two geographical theories of the southern *Antipodes* and of Ptolemy's strip of land, this hypothetical land became "*Terra Australis recenter inventa, sed nondum plene cognita*" [the land of the South recently found, but has not yet fully known], as geographer Oronce Finé put it in 1534. Later references to *Terra Australis Incognita*, or "Unknown Land of the South," would elaborate on these ancient theories, and maps drawn between the 15th and 18th centuries often included it at the bottom or as an inset on world maps.

It brings to mind the phrase coiled across countless southern continents in the cursive script of irony-free cartographers: *Terra Australis nondum cognita.* The translation varies with the specific Latin phrasing, but the message was consistent*: the southern continent not yet known, the southern continent not yet discovered.* The implication is unambiguous: while it may not be known, it is known to exist. While it is not yet discovered, it awaits discovery. These were not suggestions of possibility;

they were promises of reward to the suitably industrious and bold. Just what form existence would take, nobody could be completely sure; nevertheless, more than a few offered suggestions. Reasoning by analogy, extrapolating from the known and nearby, projecting from understandings of climatic zones, postulating based on latitudinal determinism, enlarging rumor, employing deductive reasoning based on fragments of geographical data, resorting to imagination precipitated through the filter of desire, that is how the southern continent came to take form. It was not a form fixed and unchanging like the geocentric earth of God's creation; the southern continent would change based on what was known and desired, and was the more potent for it. Even better, the form was tangible, the sort of form that could be described in instructions to explorers and navigated toward with the maps of cartographers.

None of the names or renderings mentioned above truly referred to the Antarctica we know today, since it would be hundreds of years before the continent was actually seen, but they did fuel a geographical myth that persisted for centuries to come.

The famous *La Cosa* map of 1500 *(#305)* exhibited the northern coast of South America, together with the eastern coast down to about 25° S. The 1508 *Ruysch* map *(#313)* also showed the eastern coast, but only down to 38° S.; while the *Sylvanus* map *(#318)*, in the Ptolemy of 1511, stopped at 35° S.; *Stobnicza (#319)*, 1512, at 40° S.; the *Ptolemy of 1513* at 39° S.: and the *Margarita Philosophica* of Gregory Ruysch, 1516, at 49° S. Nevertheless the *Lenox* globe of 1508 *(#314)* gives all of South America, rendering it probable that the draughtsman was not unacquainted with the configuration of Terra del Fuego. How, then, could this globe-maker have known that South America terminated in such a form near latitude 55° S? How, in fact, could he have known that it terminated at all, especially since sketches later than 1515, with one or two unimportant exceptions, represented Terra del Fuego as joined to a great continent, that was supposed to cover the entire region around the south pole?

On this point it may be observed that such a termination to South America was doubtless rendered probable by the argument from analogy. The ordinary observer must have perceived that the great bodies of land on the globe terminated towards the south in points. Good reasons also exist for believing that Africa was accepted as the "model" for South America. But it is by no means unreasonable to suppose that the termination of South America was known in 1510, even though its circumnavigation had apparently not been accomplished until 1520. In 1508 it was recorded by Johannes Ruysch *(#313)*, that navigators had reached 50° S. On his map is found a Latin legend, translated as follows: *Portuguese mariners discovered this part of this territory, and proceeded as high as the fiftieth degree of South latitude, but without reaching its southern extremity.* Alexander Humboldt *(Examen Critique, II. 7)* calls attention to the fact that in the fourteenth chapter of the work, in which the map of Ruysch appears, there is a separate statement, to the effect that the Portuguese had surveyed the coast of South America as far as 37° S, and that it was known as far as 50° S by report. Thus in 1508 there existed at Rome a general understanding of the coast to within about two degrees of the entrance to the Straits of Magellan. With such facts before him, Humboldt came to the conclusion that between the years 1500 and 1508 a succession of attempts were made by the Portuguese along the coast of South America, beginning at Porto Seguro in latitude 16° S. Vespucci is even credited with having gone to 52° S. Still the student is not justified, with such data, in

declaring precisely how far the navigators knew the region by actual observation. The inference is that the navigators who passed along that region viewed the strait afterwards discovered by Magellan as an inlet, and that they learned from the natives the configuration of Terra del Fuego. Such information has been given to navigators in every part of the world. The French explorer Jacques Cartier in Canada knew of the Great Lakes from the aborigines. The Indians also drew rough sketches for Champlain in New England. The Hudson's Bay Company possess at their House important sketches made by the Indians; while Balboa, called the "Discoverer of the Pacific" had the Pacific discovered for him by the Cacique of Zumaco, who, upon the arrival of the Spaniard in the Bay of Panama, figured for him the coasts of Quito, and described the riches of Peru. *(Examtn Critique II. 13).* Columbus on his fourth voyage learned of the existence of water beyond Darien. Parry and Ross had the coastlines of their charts extended for them by the Esquimaux. This was all that the Spanish and Portuguese navigators needed to have done for them by the natives of Terra del Fuego.

As maps became more widely disseminated in the early modern period with the advent of the printing press, and increasingly popular as artifacts of erudition, cartographers set to work expressing in visual form both the non-empirical lore and the geographical data that suggested the existence of a southern continent. It was once the mapmakers started to give expression to such geographical ideas and information that the southern continent began to gain a relentless momentum as a cosmographic and aesthetic entity synonymous with images of the globe.

It must be noted that many old maps do not contain inscriptions, accompanying text, or other notations that reveal the intentions or understanding of their authors. In such cases, close examination of the map in question coupled with insights extracted from studying the context of the fields of study to which the map belongs is often sufficient to provide a set of possible explanations of authorial intent and understanding—while nevertheless not allowing historians to offer definitive conclusions. Such a caveat is necessary before more closely examining a map of special interest, but about which our knowledge is fractured and incomplete. The 1506 map by Giovanni Contarini and engraver Francesco Rosselli, shown below, may mark the beginning of a new tradition of imagining austral lands *(#308).*

Below is a series of maps that, while by no means complete, follows this evolution of Antarctica on early maps in some of its key phases. More than mere directional aids, these maps are beautiful fusions of art and science crafted centuries before the benefit of modern navigational equipment.

World map, 1506, by Giovanni Contarini (#308)

The reason Contarini's South American continent is much larger than any cartographer before him had depicted it is because he seems to be joining together – as one continent – the discovered coasts of Brazil with the idea of antipodal lands running across the southern latitudes of the hemisphere. If this is the case, Contarini joins the ranks of cosmographers who in the early years of the 16th century subscribed to the notion of the mega-continent: the idea that South America was connected to a sprawling southern hemispheric continent, and then, in some imaginings, with North America and then North America to both Asia and Europe. It would also make Contarini's map the first rendering of the southern continent which extends about the Antarctic region. It will never be known beyond the shadow of a doubt if Contarini had in mind this grand cosmography, but others have left no doubt that they did.

The South Pole on the Lenox globe, 1508 (#314) showing no landmass

Terra Australis on the 1508 world map by Francesco Rosselli (#315)

The first extant early modern map to unambiguously depict a southern continent is Francesco Rosselli's world map of 1508. The Greenwich version of this map is stunningly hand-colored, and there is, plain to see, a modest southern continent located to the south of the Cape of Good Hope. This is the first map that has passed down which shows a southern (not South American) continent depicted on a map which utilizes a latitudinal–longitudinal grid. As mentioned earlier maps like the medieval Macrobian type *(#201)* show a southern continent, but its rending is generic and figurative—depicted conceptually, without any particular form or characteristics, because the only information being conveyed concerned the general theory that southern hemispheric lands might exist. In early modern maps, starting with Rosselli, the southern continent unavoidably acquires magnitude, location and geographical characteristics, in keeping with the rest of the map.

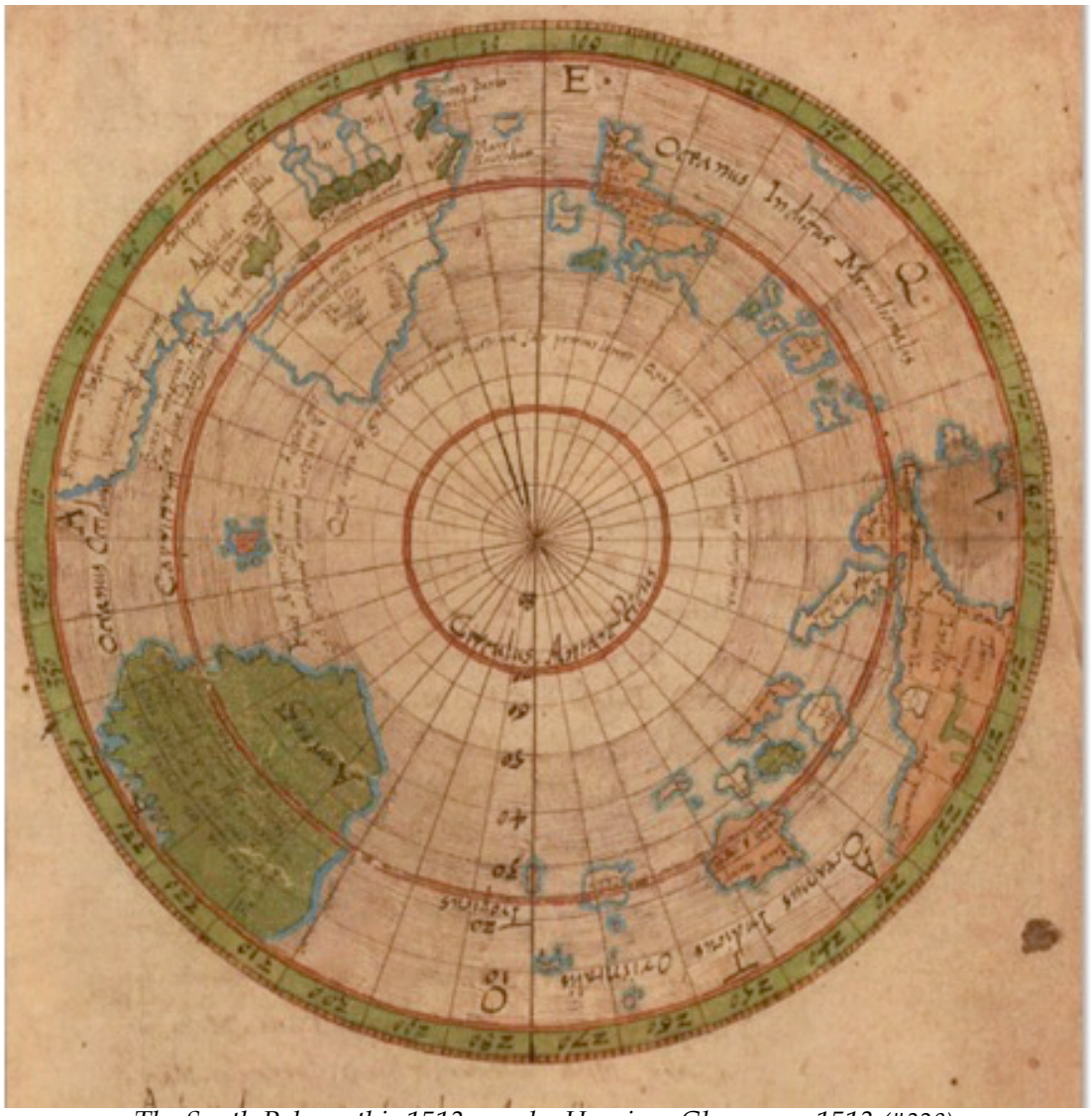
The Antarctic coastline cannot be confirmed as the stuff of empirical lore, but what about non-empirical lore? In support of this possibility it is worth noting that the modest size of Rosselli's southern land is more in keeping with the ancient quadripartite cosmography of multiple non-*oikoumenical* landmasses than if he had depicted a mainland sprawling right across the bottom of the map. However, not all is as it seems with this map. The stunning and most well known Greenwich version of Rosselli's map is not, in fact, faithful to the original print: it contains manuscript additions—meaning it has been altered by hand after being printed. Indeed, of the four extant copies of the 1508 Rosselli map, all contain different manuscript modifications to the original cartography. Thanks to the Holzheimer copy of the Rosselli map, a version that has not been colored, it is evident that the original print contained the northern border of a southern continent, but no southern border to complete the landmass. It was, then, in the first instance, a lot less suggestive than the bold image seen on the Greenwich version. Whoever colored the Greenwich version—as with the Zwickau version—added in a southern border to make a complete, insular landmass. By doing so these maps increase their value as both cartographic and aesthetic commodities—which they clearly are, given the expense of

coloring was indulged. Indeed, as David Woodward notes, "color has been applied so thickly that it has obliterated the line work underneath, and in this sense has privileged decoration over information." What can be concluded from this is that whatever Rosselli's original intentions, the hand-colorer(s) of these maps thought it reasonable to turn this land into an insular southern continent, evidence that the geographical lore of *Antipodes* was a real influence on cartography and geography.

Even more interesting is the Florence version of the Rosselli map which reveals a different kind of manuscript modification: the northerly coast of the southern continent has been extended east and west to the borders of the map, making the southern landmass circumfluent around the South Pole and turning it into an enormous continent filling the higher southern latitudes. Assuming the manuscript additions are contemporaneous with the map, it means that all of a sudden there exists a fully formed instantiation of the southern continent—a southern continent that approximates to the size and magnitude of the imaginary land that will come to be known in later years as *Terra Australis*. Of course, it is unclear exactly when the manuscript additions were made, but if they are anything like contemporaneous with the map then this would be evidence of the currency in the first decade of the 16th century of the notion that a vast continent existed in the unexplored southern latitudes of the globe.

Note that Rosselli's 1508 map includes what appear to be the symbols for five cities populating his southern continent. There is no clue as to what inspired this.

World map by Francesco Rosselli in Biblioteca Nazionale Centrale, Florence, Italy



The South Pole on this 1513 map by Henricus Glareanus, 1513 (#328) showing no distinct southern landmass

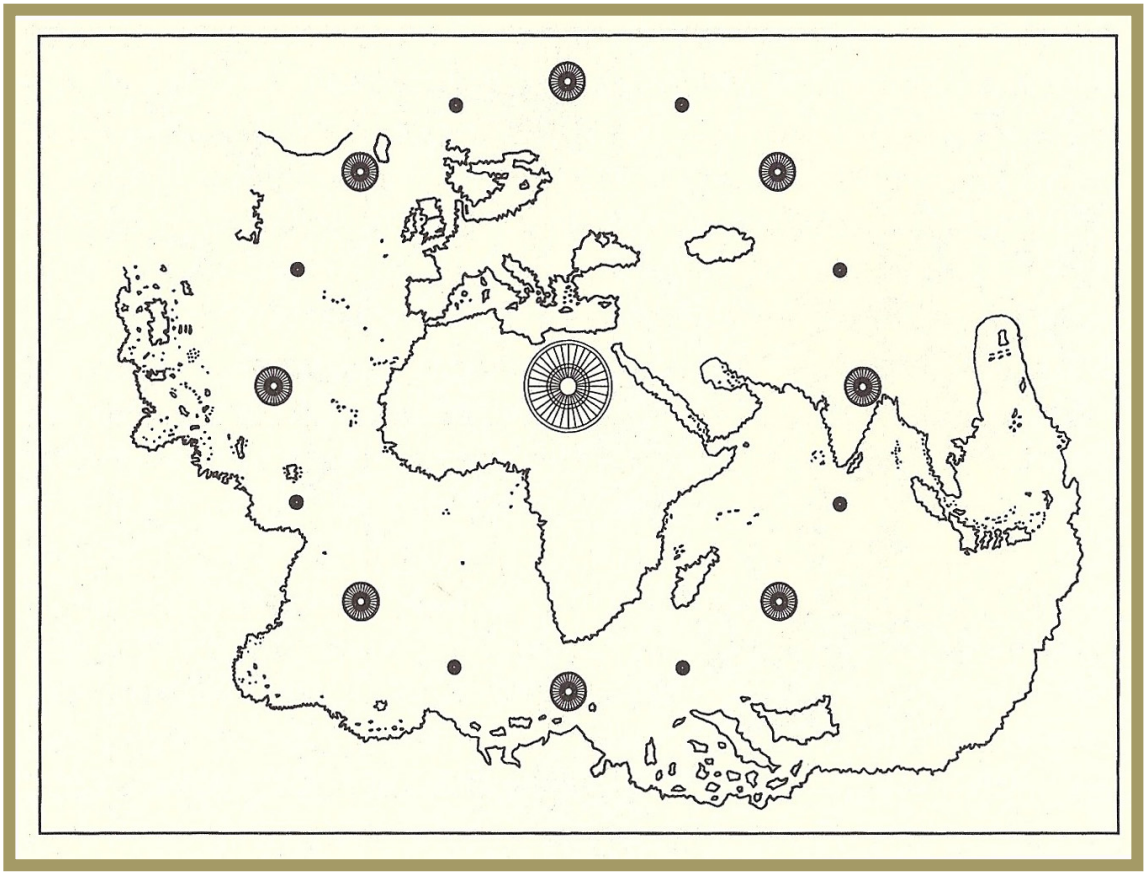
The South Pole on the Universalis Cosmographie Descriptio Tam In Solido Quem Plano, based on the Toss Globe Gores by Louis Boulinger, 1514 (#324)
Facsimile produced by Dr. D. W. Larson, Emeritus Professor
University of Guelph, Guelph, Ontario, Canada

The 1513 Piri Reis Chart of the Ocean Sea (#322)

Antarctica and the Eastward-Trending Coast. The presence of a land to the south, often connecting all major landmasses like Africa and South America, had a long tradition in geographical thought, originating with the ancient Greeks, many of whom believed such a land must exist in order to balance the *oikoumene*, or the inhabited landmass of the northern hemisphere. The Greeks also believed that land surrounded water rather than water surrounded land. Some cosmographers of the early 16th century held that the ocean was surrounded by land. This theory, in which Africa and Asia were connected to a southern continent, *Terra Australis*, held that the Indian Ocean was landlocked sea. This theory originated with Hipparchus in the second century B.C. and was later promulgated by Claudius Ptolemy as a land bridge between Africa and Asia *(#119).*

The Ptolemaic geographical theory of the distribution of the lands and seas formed the major geographical conception of Europeans in the 15th and early 16th centuries. The maps of Ptolemy, widely printed after 1477, show a *Terra Incognita* south of 15° S, connecting Africa and Asia. Even after the sea route from Europe

around the south of Africa to India and the Far East was found and the absence of land connections from southern Africa to southern Asia was determined, Ptolemy's authority among Renaissance cosmographers and geographers continued, and this great southern landmass was a common feature of 16th century world maps. Even the great Geradus Mercator, according to his contemporary biographer, believed in this continent, which he "realized was unknown and still awaiting discovery, but whose existence he thought he could prove by solid reasoning and argument. It could not be less in its geometric proportions, size, weight, and gravity than the other two [the Old World and the New World], otherwise the world would be unable to remain on its axis. Writers call this the Southern Continent."



Outline of a suggested reconstruction of the whole Piri Reis world map of 1513

There may, in fact, be an even simpler explanation of the presence of "Antarctica" on the *Piri Reis* map. To start with, as Charles Hapgood admits in *Maps of the Ancient Sea Kings*, about 900 miles of South American coastline are missing from the map: below the Rio de la Plata the coast simply turns eastward. And, interestingly, if this eastward section of coast is looked at vertically, that is, as continuing south instead of east, it does bear a remarkable resemblance to the actual east coast of South America from below Rio de la Plata down to Tierra del Fuego. Some of the smaller coastal features, moreover, conform with a modern map as well, and the small group of three islands *(Ma de Sara)* could then be identified as the Falkland Islands, and the wedge-shaped projection at the most easterly point of the line could correspond to the tip of South America.

To put it more simply, Piri Reis, or the scribe who copied his work, may have realized, as he came to the Rio de la Plata, that he was going to run off the edge of his valuable parchment if he continued south. So he did the logical thing and turned the coastline to the east, marking the turn with a semicircle of crenellations, so that he could fit the entire coastline on his page. If that was the case, then the elaborate Hapgood hypotheses of an ancient advanced civilization - or at least those elements based entirely on the *Piri Reis* map - would have no foundation whatever.

When the authoritative views of Ptolemy were combined by geographers with the newly discovered open sea to the south of Africa and the newly discovered continent to the west of Europe, a belief in a land connection between South America and the southern continent seems to have arisen. The connection of South America to *Terra Australis* shown on the Piri Reis map is also shown on the Portuguese Lopo Homem map of c. 1519-21 (*#329.1*) and the Spanish Juan Vespucci map of 1524 *(#335).* A slightly similar arc to the southeast coast of South America is seen on the Cantino map of 1502 *(#306)*, the Contarini-Rosselli map of 1506 *(#308)*, and the *Lenox* globe of c. 1510 *(#314)*. While none of the maps derived from de Canerio's shows an Antarctic continent *(#307)*, other groups of early maps do. Beginning in the early 15th century, mapmakers often indicated a huge southern landmass that linked Africa to Asia and made a landlocked sea of the Indian Ocean, a geographical notion derived from Ptolemy's references to a "southern land". When Magellan passed through the strait that now bears his name, he sighted Tierra del Fuego to the south and assumed that it was a promontory of Ptolemy's southern landmass; it was not until Drake's southern voyage of 1578 that this idea too was abandoned.

Lopo Homem world map, 1519-21 (#329.1) showing South America connected to the southern continent that wraps around to Asia, like the old Ptolemaic land-locked India Ocean.

Duarte Pacheco Pereira was a true Renaissance man: cosmographer, geographer, explorer, soldier. He wrote the geographical treatise Esmeraldo de Situ Orbis *around 1508. In Pereira's cosmography, every mainland – imagined and real – is linked: the northern and southern American lands are one, and in turn they join with the Antarctic continent in the south, and the oikoumene in the north. You can see just what this cosmography would have looked like in this 1519 map of Lopo Homem. The Antarctic aspect of Homem's mega-continent is labeled, like Brazil,* Mundus Novus *[New World]*

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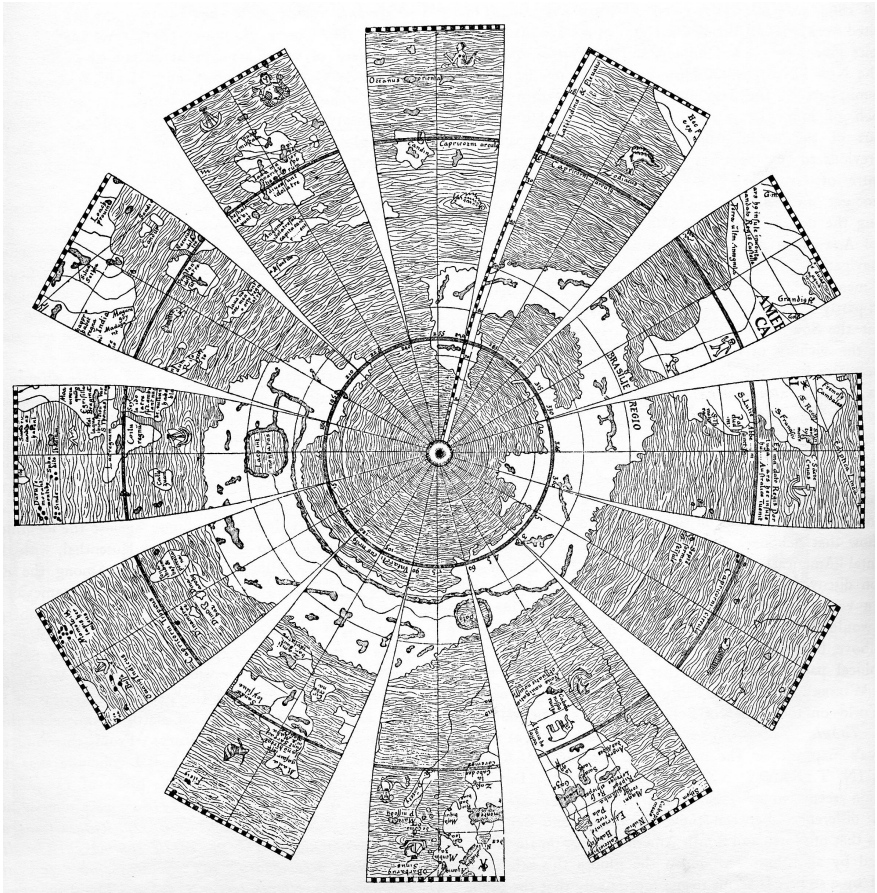
The search for *Terra Australis* went on for centuries, incidentally leading to the discovery of the land which now fittingly bears the name that so fascinated Renaissance cartographers: *Australia*. But Antarctica itself eluded the great discoverers. There are, however, some indications that the coast of Antarctica was sighted before its "official" discovery in 1820. In 1505 Amerigo Vespucci related how, blown off course and driven 500 miles south, he sighted a land which he named *Terra da Vista* [Land Seen], and which was possibly the Falklands or even Antarctica. In 1514, the year after the completion of the *Piri Reis* map, two Portuguese ships reported something similar, as did two Dutch ships about the same time: also blown off course, they sighted land and named it *Pressillgtlandt*. Whatever land was sighted on these obscure voyages, the accounts prove one thing: there was no inherent impossibility in a 16th century ship reaching Antarctica.

Antarctica on the 1515 globe by Schöner (#328)

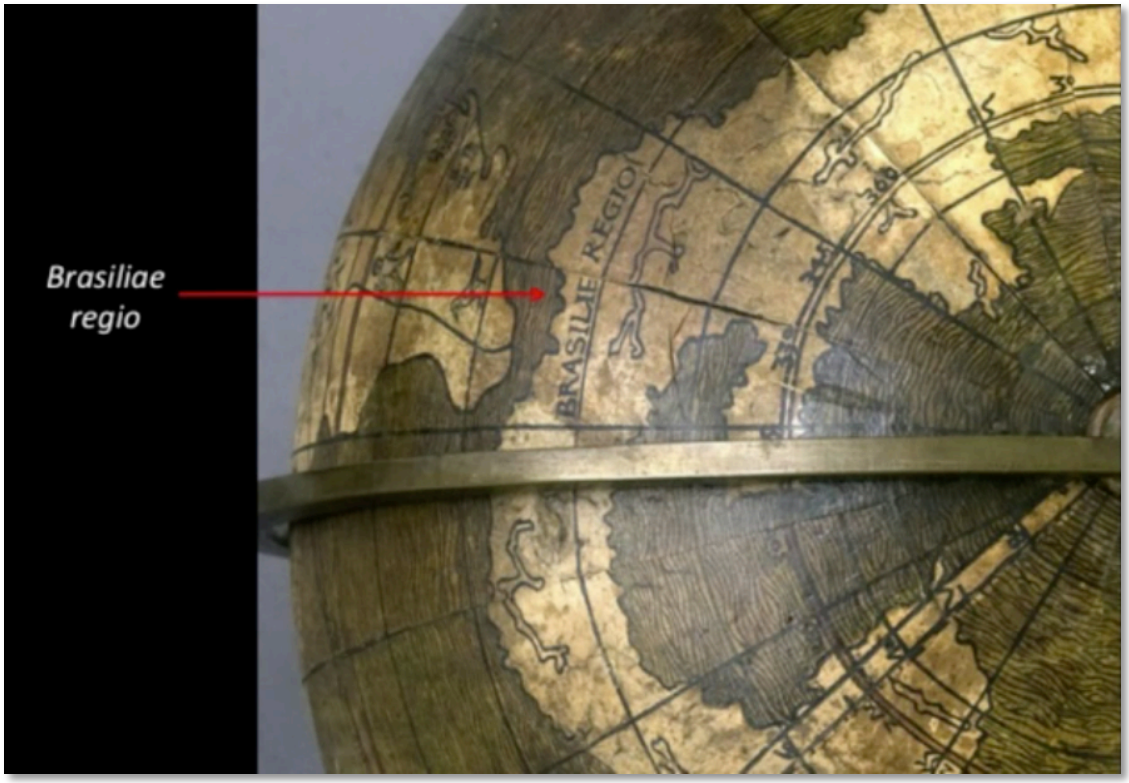


Antarctica on a reproduction of the 1515 globe gores by Johannes Schöner, a facsimile from Jomard/ Nordenskiöld (#328) The southern continent showing two lakes, each surrounded by mountains, joined by a long river, thought by some to be the source of the River Nile in Africa

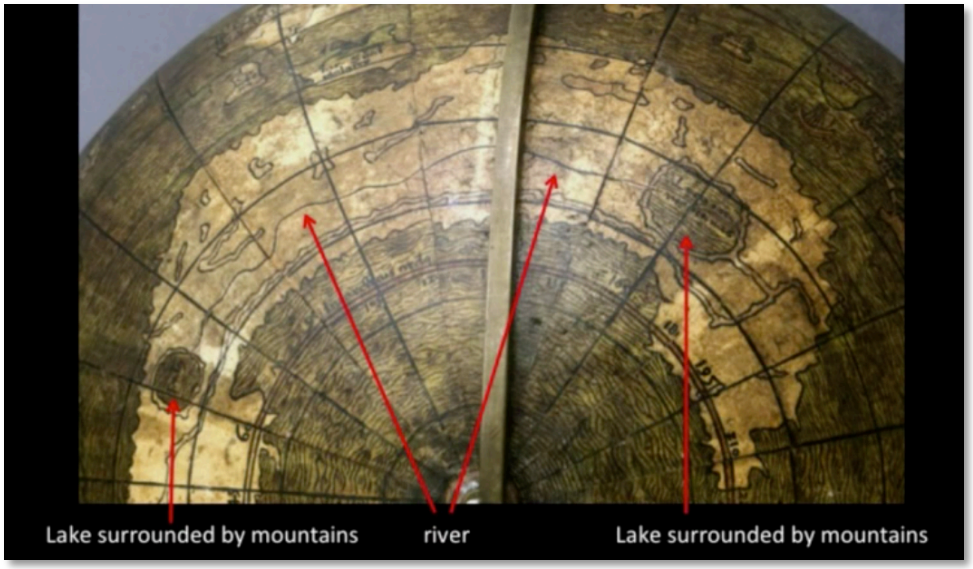
The southern continent on Schöner's 1515 globe, which is labeled BRASILIE REGIO, is one of its most distinctive and curious features. It is one of the earliest depictions of a southern continent in a non-zonal map. Schöner shows an incomplete ring of land around the South Pole, with an opening into the southern Indian and Pacific Oceans, quite different from the simpler, convex island-continents shown at the South Pole on other 16th century maps. On Schöner's continent there are two huge lakes connected by an immense river that traverses about 90º of longitude, and a mountain chain running parallel to (and south of the river that covers almost 180º of longitude. Both of the lakes are surrounded by mountains; one is labeled *Laco in montaras* [Lake in Mountains], and the other simply *palus* or "swamp." On ff. 61r-61v of his *Luculentissima*, Schöner describes *Brasiliae regio* at some length: "It is inhabited by people who wear the raw hides of lions, leopards, and beavers, and commonly live to be 140; the land has mountainous areas, ample reserves of gold, silver, and copper, and plants and animals that are unknown in Europe".

The historian Lawrence C. Wroth states that it is clear from what has been written that when Schöner showed a vast *Brasilie Regio* centering upon the South Pole he was carrying on an unsubstantiated theory which his age had received from the Greek scientists of antiquity, men who had postulated the existence of a southern

continent as a counterpoise to the weight of the known world of the north temperate zone. The identification of Tierra del Fuego as the northern tip of an austral continent not hitherto seen by European man may, therefore, have been as exciting to some of the learned contemporaries of Magellan as the fact of his circumnavigation of the globe.



Schöner says that the land was discovered by the Portuguese, that it is not distant from the Cape of Good Hope, and that it runs east and west. He also says that the inhabitants of the land wear untreated animal skins, use bows and arrows, have cassia and unusual birds, and abundant gold and silver-clearly he is describing the "Brazil" in South America.



Another map, 1649, based upon the Roman Pomponius Mela AD 43, expressing the notion that the River Nile originates in the Antipodes

A view of the South Pole on a drawing of the Western Hemisphere on the 1520 globe of Johannes Schöner showing a shift in his vision of the southern landmass (#328)

If it is a vast landmass spanning the breadth of the southern hemisphere that is sought, then the first printed map that can be verified to have depicted such a geography is Johannes Schöner's seminal globe of 1515. It would be natural to describe Schöner's southern landmass as unusual in its composition, given that it forms a broken ring of land encircling an Antarctic sea, rather than filling the entire space with land. On reflection, however, a better word would be unique, because the image of *Terra Australis* in its Mercatorian guise—the image most familiar to moderns in which a continent occupies the entirety of the more southern latitudes—is the product of years of evolution of this concept. As best is known, Schöner had no specific cartographic predecessor to draw upon (though, of course, the concept of a southern continent in one form or another was already established) when constructing his prototypical southern ring continent.

We are fortunate to have a comparatively rich store of documents from Schöner, including multiple maps and globes and, importantly for the present

inquiry, the pamphlet Schöner produced to accompany his 1515 globe. In that pamphlet Schöner describes the southern continent that he labels *Brasiliae Regio*:

> It is but a little distance from the Cape of Good Hope, which the Italians call Capo de Bona Speranza. The Portuguese have circumnavigated this region, and found a crossing there quite similar to the configuration of the land in Europe, which we inhabit, and situated between the east and the west.

A view of the South Pole on 1520 globe by Johannes Schöner (#328)

With Schöner there is finally a widely distributed cartographer of renown depicting a vast and detailed continent encompassing the Antarctic regions. There was no turning back: the idea of the *Antipodes* had crystallized into more than just a theory—it had become part of the matrix of geographies determining the cosmographic interpretation of discoveries. It helped make sense of the world.

What makes the ongoing crystallization and evolution of the idea of a southern continent so fascinating is the way exploration and discovery enhanced the concept of southern lands rather than damaging its currency. Explorers framed their voyages and reported their discoveries, and cosmographers interpreted the explorers' reports, through the preconceptions of geographical lore. To quote J. Wreford Watson:

> where men had the choice they preferred to go on believing in their old illusions. Preconceived notions of what they might find, led them to think they had found what they wanted. So often men only see in the world, the world they want to see. Perhaps nowhere is this more true than in the world of maps.

Waldseemüller shows no southern continent on his 1507 map (#310), and the only contemporary maps or globes that have a similar "ring continent" are the anonymous *Green Globe* of c. 1515 (#342.1 Paris, Bnp, Res. Ge A 335) and Schöner's own 1520 globe (#328, Nurnberg, Germanisches Nationalmuseum, WI 1).

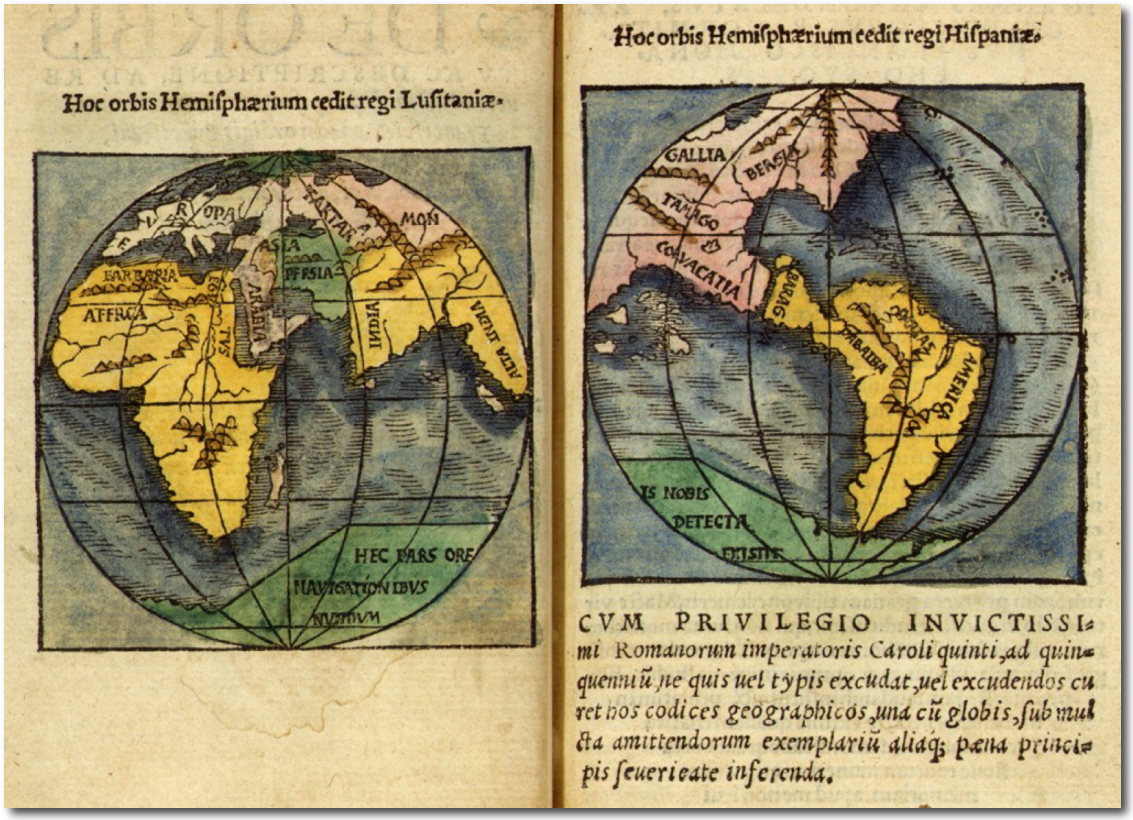
Paris Green-Quirini globe showing an unnamed southern continent, 1515-1528 (#342.1)

One of the less beneficent results of the Magellan expedition (1519-1522) was the confirmation of belief in that fabulous Antarctic continent which had been a figment of men's minds since the time of the Pythagoreans, and which for the two centuries and a half after the circumnavigation of 1522 was to haunt the geographers and to appear, now a pale ghost, now a more substantial apparition, upon the maps they produced. Passing through his strait, Magellan had for many days to the south of him the land that he called *Tierra del Fuego* because of the fires that, from time to time, he observed upon its shores. No specific statement survives from him as to whether or not he believed this to be continental land, but the name he gave it suggests that he did not think of it as an island. Contemporary geographers, at any rate, concluded that Tierra del Fuego was the tip of a southern continent separated from South America by the narrow strait through which the navigator found his way into the western ocean.

If it is true that Magellan had been influenced by the Schöner globe of 1515, he must have been predisposed to belief in the existence of a huge land mass immediately south of his course, for in that puzzling work of cartography, as previously suggested, the land called *Brasilie Regio,* lying south of the false strait at 45°, presented all the appearance of a vast continent surrounding the South Pole. But that reflection is by the way; neither Schöner nor Magellan, nor any man of that age, had conjured into being this image of a vague continent to the southward. Belief in such a continent was almost as old as the record of human thought.

Hence, when Magellan discovered Tierra del Fuego, the gains to the idea of a southern continent were enormous; it was the turning point where what had been a cosmographic conjecture became a part of the known world. It made the southern continent real. In time, Tierra del Fuego was shown to be just an island, as was *Staten Island*, the land that replaced Tierra del Fuego as a promontory of the southern continent. But neither revelation could nullify the belief that had come to be stored in

Terra Australis. Coastlines could be revised, expectations dampened, but once given life an imaginative geography like *Terra Australis* becomes a pliable, reflexive idea that transcends the fragments of information that help make such an entity seem real in the first place. Merely eroding shores or banishing an entity to beyond the horizon is rarely enough to invalidate the very notion of the geographical entity existing.



Franciscus Monachus's world map of 1527 (#337)

It seems to be a fact that for some two centuries and a half after the passage of the Strait of Magellan in 1520, the hope of making discovery of the *Terra Australis* was a strong motivation of Pacific exploration. In the wake of Magellan's voyage among the first wave of printed maps incorporating the new data was Franciscus Monachus' world map of 1527 *(#337).* The most arresting element of the map is the southern section between Africa and South America where the southern continent is tentatively delineated by means of straight lines. By sectioning off this enormous grid of space Monachus is asserting that it is within this region that the southern continent exists, but that the necessary information to sketch the contours of its coast is yet to be attained. This message is conveyed visually as well as through the inscription annotating this part of the map, which translates as: "This part of the world, not yet discovered by navigators, exists." If yet undiscovered, how does Monachus know it exists? The answer is in the image. Flanking the strait lines are the familiar irregularities of a coastline. In particular, the southern continent is depicted as the land to the south of the strait discovered by Magellan, clearly communicated by the fact the coastline is here contiguous with South America. It is that one piece of information that allowed Monachus to extrapolate an entire continent, occupying up

to 50º of latitude and 360º of longitude. Thus, though Monachus adopts a cautious cartographical approach to depicting the unknown regions, the presence of that single item of empirical data transforms the southern continent from cosmographical fancy to geographical reality. Indeed, that single piece of empirical data was capable of standing in for the entire southern continent—it was a proxy for the rest of the southern continent's geography then unavailable to Europeans.

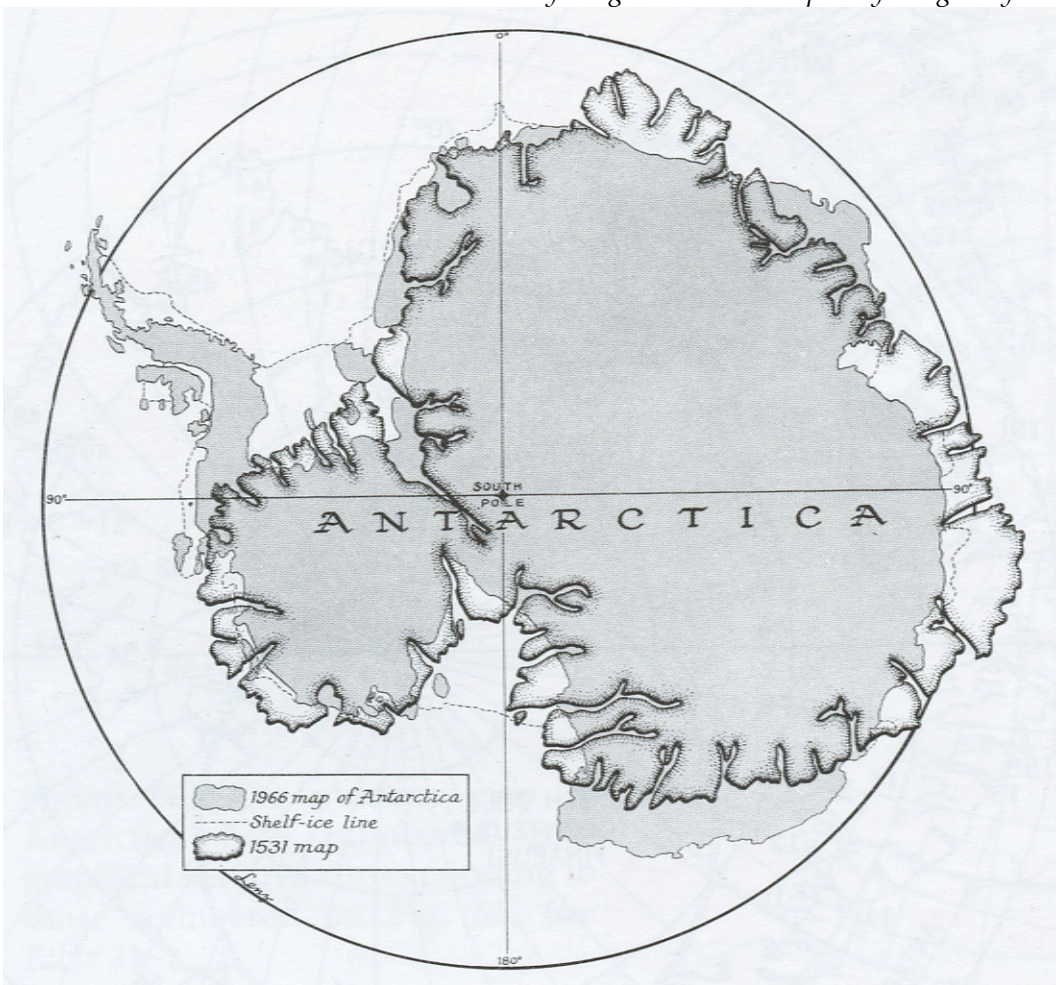
In the work *De orbis situ*, which contains the following remarkable passage: "*Praterea inventa anno abhinc millesimo quingentesimo vigesimo sexto, terra longitudine o. meridionali latitudine, 52. partium cultoribus vacua. Reliqua Australis ora etianum in obscuro latent* [Moreover in the year 1526 a land has been discovered by 0 degrees longitude and 52 degrees south latitude, which is not inhabited. The other parts of that Austral country are yet in the dark]. The historian Henry Harrisse asks: "What is that Austral country beginning on a line with the initial meridian, and in such extreme southern latitude, which Franciscus Monacus says was discovered in 1526?" The latter date can only be a *lapsus pennae*, as no such discovery was accomplished in that year. As to the country itself we have only to compare its delineation and position in Franciscus' woodcuts with the Antarctic land in the various globes of Schöner to see at a glance that it can only be the region on which the Nuremberg mathematician has inscribed, in 1533, the legend: *Terra Australis recenter inventa, sed nondum plene cognita.* The difference is that Franciscus makes another *lapsus* in inserting in his map the following statement: *Hec pars ore* (sic pro orb) *is nobis navigationibus detecta nondum existit* [This part of the world has not yet been discovered [sic] in our navigations].

Lower South America and Antarctica on the Nova et integra universi orbis descripsio [Paris Gilt or De Bure Globe], 1527 (#344)

Not every cartographer of the period, however, was carried away by the newly aroused interest in the southern continent. The great manuscript *Carta universal* of Diego Ribero of 1529 *(#346)* portrays only the shores which Magellan saw from the deck of his ship, making no suggestion by the depicting of a vague shape of land extending southward that Tierra del Fuego was the northernmost out-thrust of a southern continent. The cartographer and maker of *portolan* atlases of great celebrity, Baptista Agnese *(#371),* was doubtless influenced in this, as assuredly he was in other things, by Ribero, for in his plane map of America, he follows the Spanish pilot's procedure of showing only what was known. In his oval map of the world, however, a map anachronistic in many details, Agnese goes far towards expressing a belief in. the presence of continental land south of Magellan's Strait, though not so far, perhaps, as his fellow citizen of Venice, Giacomo Gastaldi, who in his map of 1546 *(#376)* was to suggest the existence of a landmass of large dimensions in that area. The woodcut map of America known as the Ramusio map, of Venice, 1534, a straight derivative of the Ribero map, follows that production in its omission of continental land south of the Strait. The Cabot map of 1544 *(#372)* is non-committal on this point in the same sense as the map of Ribero and its derivatives.

Terra Australis [Antarctica] on the 1531 polar map Nova, et Integra Universi Orbis Descriptio by Oronce Fine (#352.1)

In this beautifully executed double-cordiform map of Fine, the southern continent is given the name by which it was to be generally known for more than two centuries, "Terra Australis," Land of the South. In many particulars, as in the portrayal of a Terra Australis, the double-cordiform Mercator world map of 1538 followed the example set by Fine, as at a later period did the great Mercator nautical chart of 1569 (#406). To realize the extent to which belief in the Antarctic continent renewed itself in the imaginations of geographers after the Magellan voyage, it is necessary only to run through Nordenskiold's Periplus and Facsimile-Atlas. An extraordinary statement of the theory at a relatively early period is found in its portrayal in the Periplus in the great world map of Pierre Desceliers, of 1546 (#378), formerly known as the Mappemonde de Henri II. In the Facsimile-Atlas one observes an extensive representation of the continent in the maps of Thomaso Porcacchi, 1572, Mercator, 1587, Joannes Myritius, 1590, Cornelis de Jode, 1593, and Matthias Quadus, 1608. Antarctica is very well defined given that at this time no known exploration had been made that even sighted this landmass. In 1531, the French cartographer Oronce Fine published this double cordiform (heart-shaped) map of the world on a polar projection, depicting a large 'Terra australis recenter inuenta, sed nondu[m] plene cognita' [southern land recently discovered, but not yet fully known]. While a number of modern writers have got excited by the implications of this information, there seems no reason to assume his delineation to be anything other than completely imaginary.



The Oronteus Finaeus map of Antarctica redrawn on the modern equidistant azimuthal polar projection, compared with the modern map of Antarctica on the same projection (Christian Science Monitor)

An odd shaped landmass representing Antarctica on a 1530 map registered as Vatican *MS Urb. Lat. 274 (#352.2)*

This largely unstudied anonymous manuscript world map of c.1530 that is Biblioteca Apostolica Vaticana MS Urb. Lat. 274, folios 73v–74r, has a hypothetical southern continent. This unusual feature forms an extravagant ring of land around the South Pole and is full of toponyms despite its designation as *Terra Incognita*. The history of cartography contains other examples of the mapping of hypothetical or mythical geographical features, but the southern continent on MS Urb. Lat. 274, folios 73v–74r surely ranks as one of the most extraordinary instances of cartographic invention. For here there is not only an entire hypothetical continent, but also a profusion of named rivers, capes, cities and ports within it. By giving names to these invented features, the mapmaker evidently hoped to lend an aura of being true or real to his creation. It is worth noting that although many rivers are marked on the known continents, relatively few are named, in contrast with the situation in the unknown southern continent.

As shown above, three globes that are earlier than the Vatican map portray an annular southern continent: Johann Schöner's 1515 and 1520 globes *(#328)*, and the anonymous *Green* globe of c.1515 *(#342.1)*. The southern continents on these globes are all similar, but the 'ring continent' on the Vatican map differs in both the abundance of named features and its shape. On the globes, the continent has a large break or opening south of eastern Asia, while on the Vatican map the continent is unbroken. Moreover, the northern coastline of the continent on the Vatican map is much more sinuous and varied, with several peninsulas, including a large peninsula jutting northward toward the *Catigara* peninsula in Asia and a second northward-jutting peninsula labeled *Regno Patalis* near the eastern edge of the map. Neither of these features appears on the globes. Thus it seems clear that the maker of the Vatican map was not directly inspired by these globes, and either gave his southern continent a

shape of his own devising or was using a source which is now lost. The cartographic researcher Chet van Duzer believes that the depiction of this continent on the Vatican map is based on theories that called for a balancing of land masses in the northern and southern hemispheres, and it is also possible that the continent was intended to represent the bounds God set on the waters during the creation of dry land (*Genesis* 1:9–10) and/or after the Noachian Flood (*Genesis* 7:11 and 8:2–5).

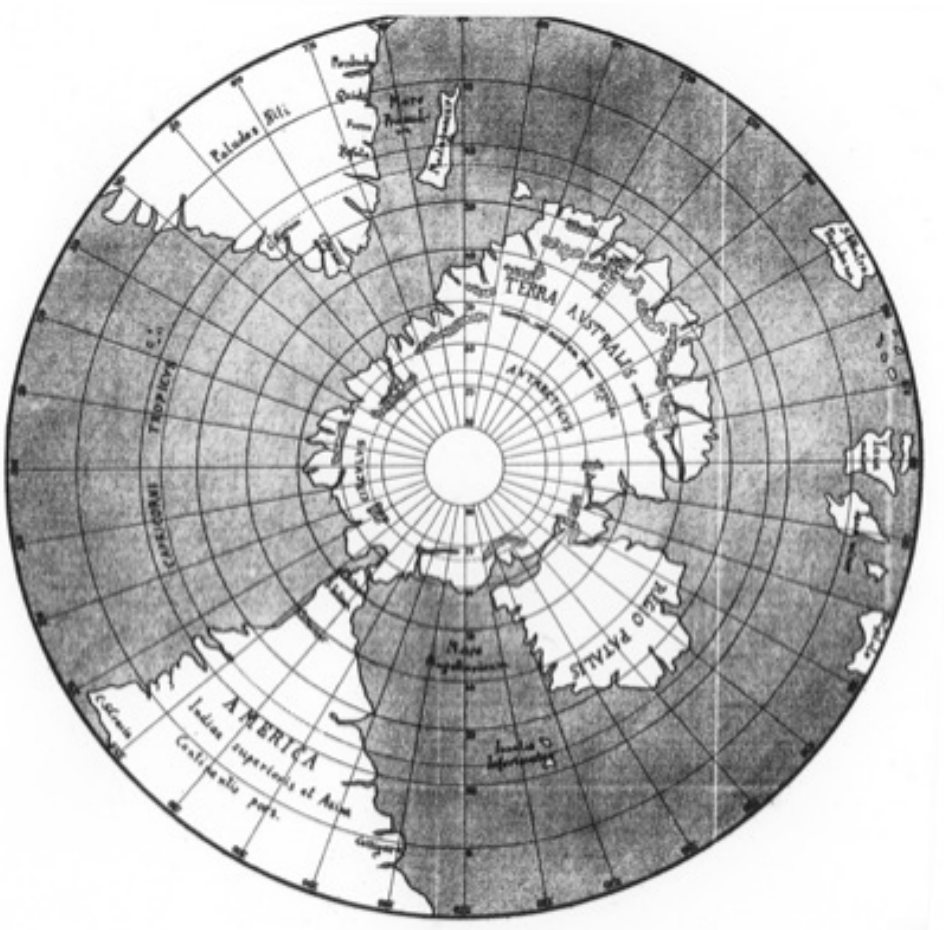
The Vatican map's southern continent is somewhat to the north of the Antarctic Circle, enclosing a sea with no islands. The whole continent bears the designation *Terra Inchognita Australe*, while the part south of Africa is labeled *Terra Australe*, and the peninsula jutting northwards towards the *Catigara* peninsula is indicated as *Terra Incognita*. The two designations of the land as *inc(h)ognita* are curious given the many place-names. There are mountains along the entire southern coast of the continent, and the rivers in the main body of the continent (as opposed to the large northward- jutting peninsula) almost all flow north.

The Vatican map's southern continent has one toponym whose source is well-known, and which appears in the southern continents of other contemporary maps: the *Regno Patalis*, a large bulbous peninsula south of eastern Asia. This place-name ultimately derives from a passage in Pliny, *Natural History* 2.75.184: *in eadem India Patalis, celeberrimo portu, sol dexter oritur, umbrae in meridiem cadunt*, [also in India at the famous port of Patale the sun rises on the right, and shadows fall to the south], which indicates that *Patale* is south of the equator. Other maps show rivers in the *Regno Patalis*, but the maker of the Vatican map is the only cartographer to have invented names for these rivers.

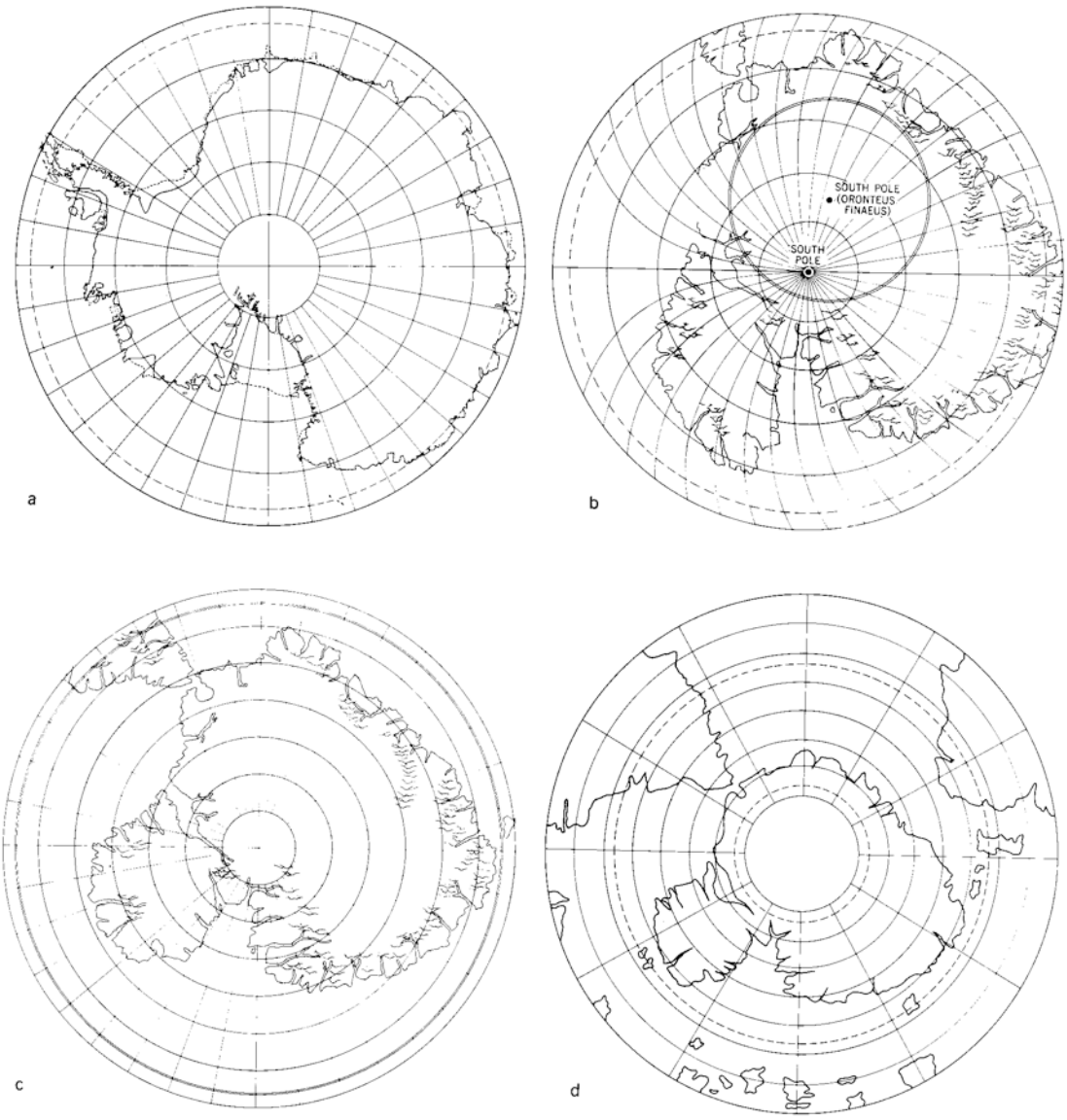
In his book, Stallard summarizes the southern continent on this map as follows: "… but unlike earlier cartographers' versions of a southern ring continent, this landmass has no inlet to the sea at the South Pole. It is one of the strangest and, despite the proliferation of place names and geographical features, least verisimilitudinous imaginings of the southern continent throughout that geography's long life in maps. For the most part, cartographers tended to imagine the unknown after the known, whereas this map is especially visually striking by dint of the way in which the southern continent departs from both existing representations of a southern continent and from the familiar forms of known lands. It makes the Vatican MS a curiosity; even though readers knew that the southern continent was *nondum cognita*, the illusion or promise of reality was often as enticing as reality itself. Imaginative geographies are characteristically marked by analogy, whereas this map presents a southern geography whose form delineates it from the empirical geographies otherwise populating the map. Put simply, the southern continent does not look real; its appearance denotes it as the imaginative geography it is."

The southern continent on the world map on folios 73v and 74r of the Vatican Library's MS Urb. Lat. 274 is certainly one of the most spectacular and extravagant examples of cartographic invention in the 16th century. Yet, amid its abundant fanciful place-names, the continent contains a copy of part of a lost early map on which toponyms from Columbus' fourth voyage were located in southern Asia. No doubt the Vatican map carries other secrets that await future investigators.

The Bailly Globe, 1530 displaying a large southern polar landmass (#351)
Facsimile produced by Dr. D. W. Larson, Emeritus Professor
University of Guelph, Guelph, Ontario, Canada



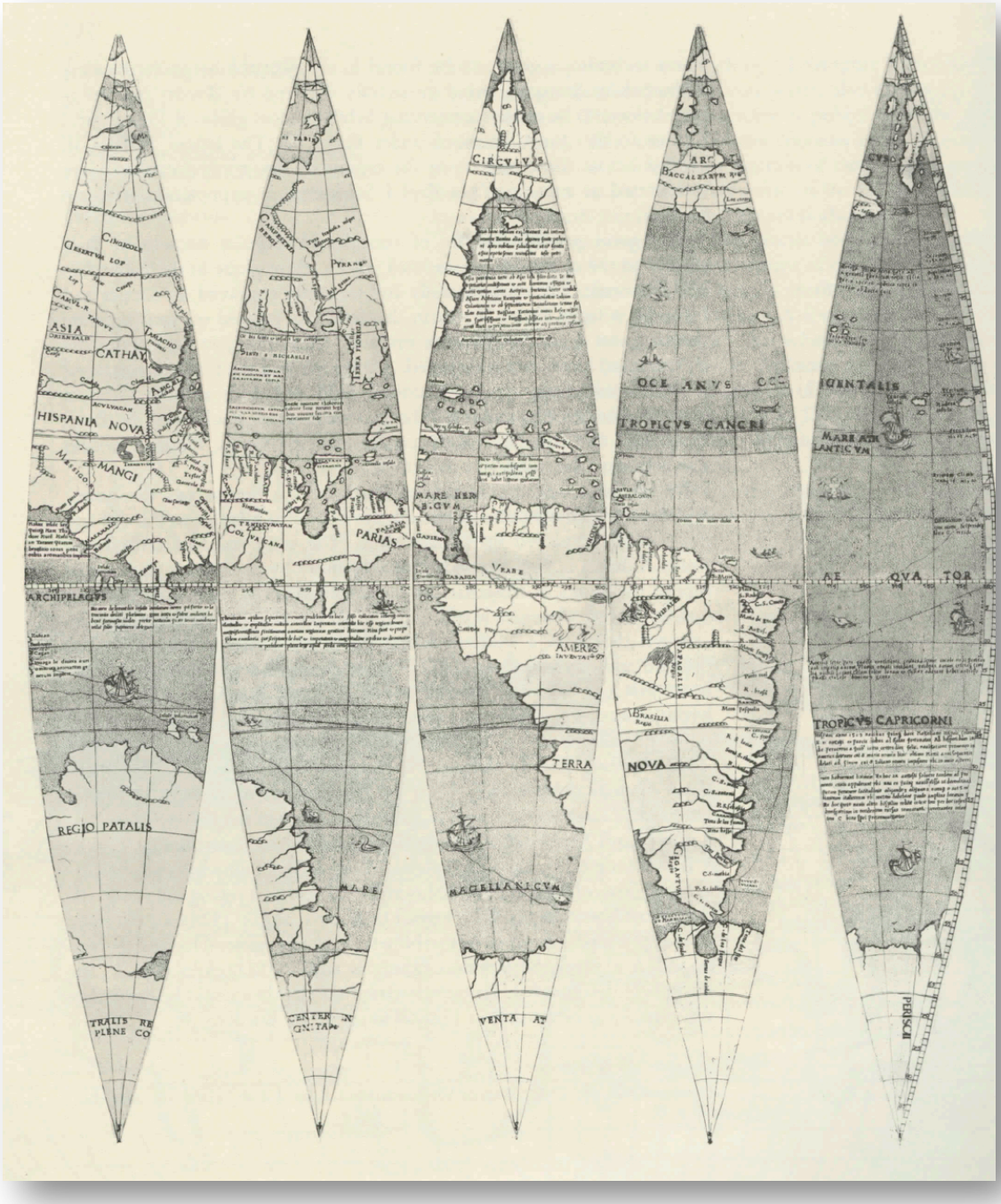
Yet another vision of Antarctica by Johannes Schöner on a drawing based on his 1533 globe (#328)



From Hapgood: Four Maps of Antarctica: (a) the modern map, (b) the Oronteus Finaeus Map, (c) the Oronteus Finaeus Map redrawn on the modern equidistant projection, (d) Antarctica from the Schöner Globe of 1523-24, also on a polar type of projection. The Schöner Globe suggests that more than one version of the ancient map of Antarctica may have survived.

Antarctica on the 1535 Paris Wooden Globe (#357)

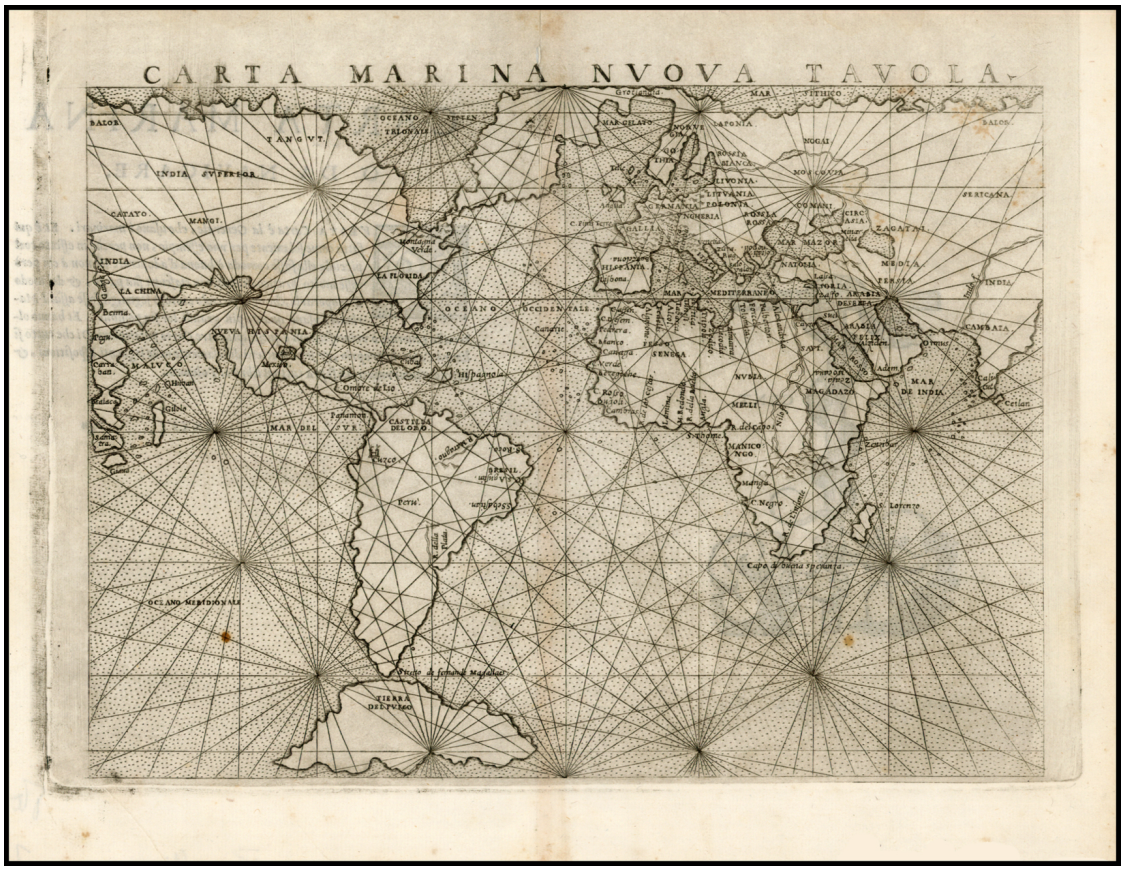
The austral lands on the *Paris Wooden* globe bear an inscription somewhat surprising. The simple cordiform map of Finaeus, 1531 *(#356, see also illustration above)* inscribes there: *Terra australis nvper inventa, sed nondvm plene examinata* [the austral land, recently discovered, but not yet entirely explored] whereas the *Paris Wooden* globe above modifies the legend as follows: *Terra australis recenter inventa anno 1499, sed nondvm plene cognita.* That is, it gives the date of 1499 for the discovery of the austral region. Historian Henry Harrisse is inclined to think that it is a reference to the voyage of Magellan, coupled with an erroneous rendering of the date in the account of Maximilianus Transylvanus: *Soluit itaque Magellanus die decimo Augusti, Anno. M.D. xix* [Named by Magellan on the tenth day of August in the year 1519].



Anonymous globe gores from 1535 showing the northern new discoveries as part of Asia, Magellan's route and an unexplored southern continent, Regio Patalis.

Globe from Caspar Vopel, 1543

Not every cartographer of the period, however, was carried away by the newly aroused interest in the southern continent. The great manuscript *Carta universal* of Diego Ribero of 1529 *(#346)* portrays only the shores which Magellan saw from the deck of his ship, making no suggestion by the depicting of a vague shape of land extending southward that Tierra del Fuego was the northernmost out-thrust of a southern continent. The cartographer and maker of *portolan* atlases of great celebrity, Baptista Agnese *(#371/1),* was doubtless influenced in this, as assuredly he was in other things, by Ribero, for in his plane map of America, he follows the Spanish pilot's procedure of showing only what was known. In his oval map of the world, however, a map anachronistic in many details, Agnese goes far towards expressing a belief in the presence of continental land south of Magellan's Strait, though not so far, perhaps, as his fellow citizen of Venice, Giacomo Gastaldi, who in his map of 1548 *(#383)* was to suggest the existence of a land mass of large dimensions in that area. The woodcut map of America, known as the Ramusio map, of Venice, 1534, a straight derivative of the Ribero map, follows that production in its omission of continental land south of the Strait. The Cabot map of 1544 *(#372)* is non-committal on this point in the same sense as the map of Ribero and its derivatives.

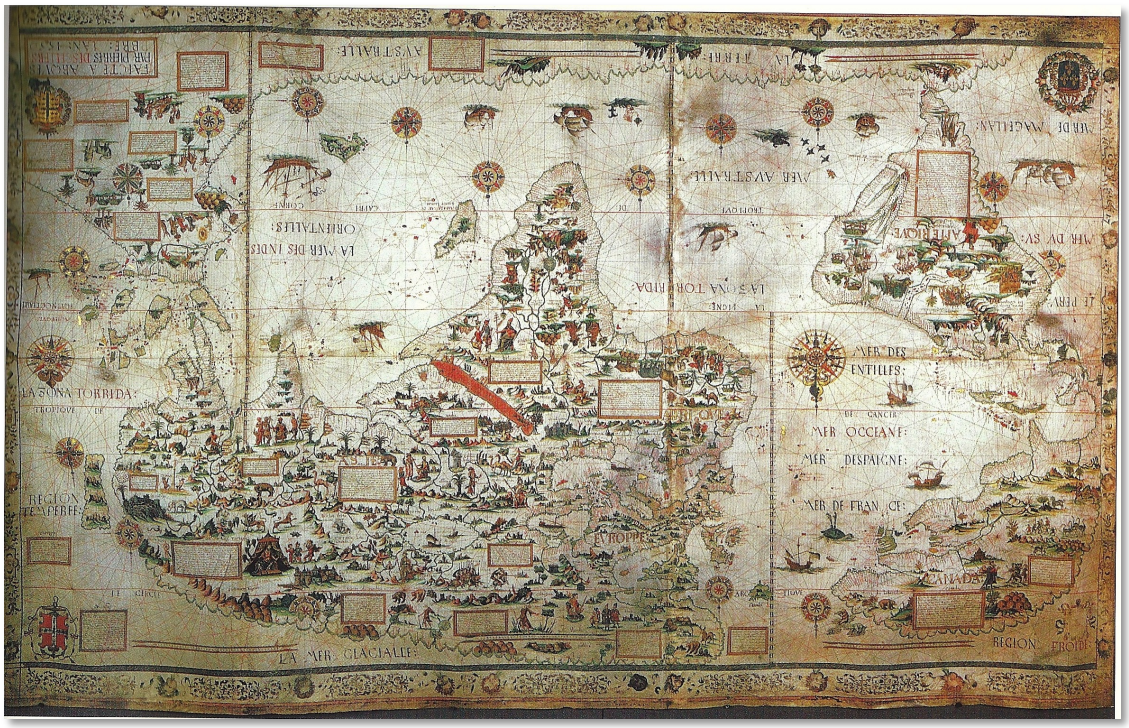


Carta Marina Nova Tabula [A new sea chart {of the world], Venice, from Giacomo Gastaldi's edition of Ptolemy's Geographia, 1548 (#383) displaying an enlarged Tierra del Fuego

Produced around the middle of the 16th century by the French school of cartographers based around Dieppe, is the depiction of a large landmass just south of Java that the Dieppe cartographers labeled *Jave la Grande*. On some maps, like the early exemplar of Jean Rotz (1542), *Jave la Grande* stands as an incomplete geography, with northern, eastern and western borders, but no border to the south. Other versions represent *Jave la Grande* as a projection of a larger southern continent that sprawls across the Antarctic regions. An example of the latter is Pierre Desceliers' 1550 world map, where *Jave la Grande* is joined to *Terre Australe* (see maps below).

Harleian/Dauphin Map, 1544 (re-oriented with North At the top)

Java la Grande on the Harleian/Dauphin map (#382.1)



Pierre Desceliers' Planisphere, 1550 (oriented with South at the top, #378)

Detail: The Southern Continent, 1550 (Australia?), displaying a cynocephalus (dog-headed) chopping up the body of another cynocephalus in preparation to eating it, along with camels, elephants, idol worshipers and miners (#378)

Detail of Pierre Desceliers' 1553 Planisphere: Eastern Hemisphere, with southern continent, (#378)

A 1555 map of Jave la Grande [Java Major or Great Java] *from the Cosmographie Universelle by Guillaume Le Testu*

In 1555 or 1556, Guillaume Le Testu published a world atlas entitled *Cosmographie Universelle selon les Navigateurs, tant anciens que modernes* and was consequently awarded the title of Pilote Royale by Henry II. The *Cosmographie Universelle* contained 56 maps reportedly based on charts Le Testu had personally drawn by hand on his expeditions.

This atlas was dedicated to his mentor and patron Admiral Gaspard de Coligny, who had become leader of the Huguenots three years earlier. The manuscript was based on charts from French, Spanish and Portuguese sources supplied by Coligny. Included in this atlas were twelve charts of *Jave le Grand/Terra Australis*, which Le Testu located southward of the Moluccas. Le Testu commented: "However, what I have marked and depicted is only by imagination, and I have not noted or remarked on any of the commodities or incommodities of the place, nor its mountains, rivers or other things; for there has never yet been any man who has made a certain discovery of it." Coligny subsequently supported a proposal from the d'Albagno brothers, for an expedition to *Terra Australis* to investigate the possibility of a French colony there. Le Testu also commented:

> This map (oriented with East at the top) contains a part of *Jave la Grande* [Java Major], which is situated in the southern part in the Temperate Zone. The inhabitants of it are Idolaters, ignorant of God, and in it grows nutmeg with cloves, and several other kinds of fruits and spices... This is *La Grand Jave* [Java Major], and *La Petite Jave* [Java Minor] in which there are eight Kingdoms. The men of these two countries are idolaters and wicked.... This Land is part of the so-called *Terra Australis*, to us unknown, so that which is marked herein is only from imagination and uncertain opinion; for some say that *La Grand Jave* [Java Major] which is the eastern coast of it is the same land of which the western coast forms the Strait of Magellan, and that all of this land is joined together... This part is the same land of the south called *Austral*, which has never yet been discovered, for there is no account of anyone having yet found it, and therefore nothing has been remarked of it but from imagination. I have not been able to describe any of its resources, and for this reason I leave speaking further of it until more ample discovery has been made, and as much as I have written and annotated names to several of its capes this has only been to align the pieces depicted herein to the views of others and also so that those who navigate there be on their guard when they are of opinion that they are approaching the said Land... This piece is a part of the *South Land* or *Terra Australis*, from imagination situated under the Frigid Zone, forasmuch as some are of the opinion that the Land of the Strait of Magellan and La Grande Java [Java Major] are joined together. This is not yet known for certain, and for this reason I am unable to describe its resources.

Common to these maps, produced around the middle of the 16th century by the French school of cartographers based around Dieppe, is the depiction of a large landmass just south of Java that the Dieppe cartographers labeled *Jave la Grande*. On some maps, like the early exemplar of Jean Rotz, 1542, *Jave la Grande* stands as an incomplete geography, with northern, eastern and western borders, but no border to the south. Other versions represent *Jave la Grande* as a projection of a larger southern continent that sprawls across the Antarctic regions. An example of the latter is shown above in Pierre Desceliers' 1550 world map, where *Jave la Grande* is joined to *Terre Australle*.

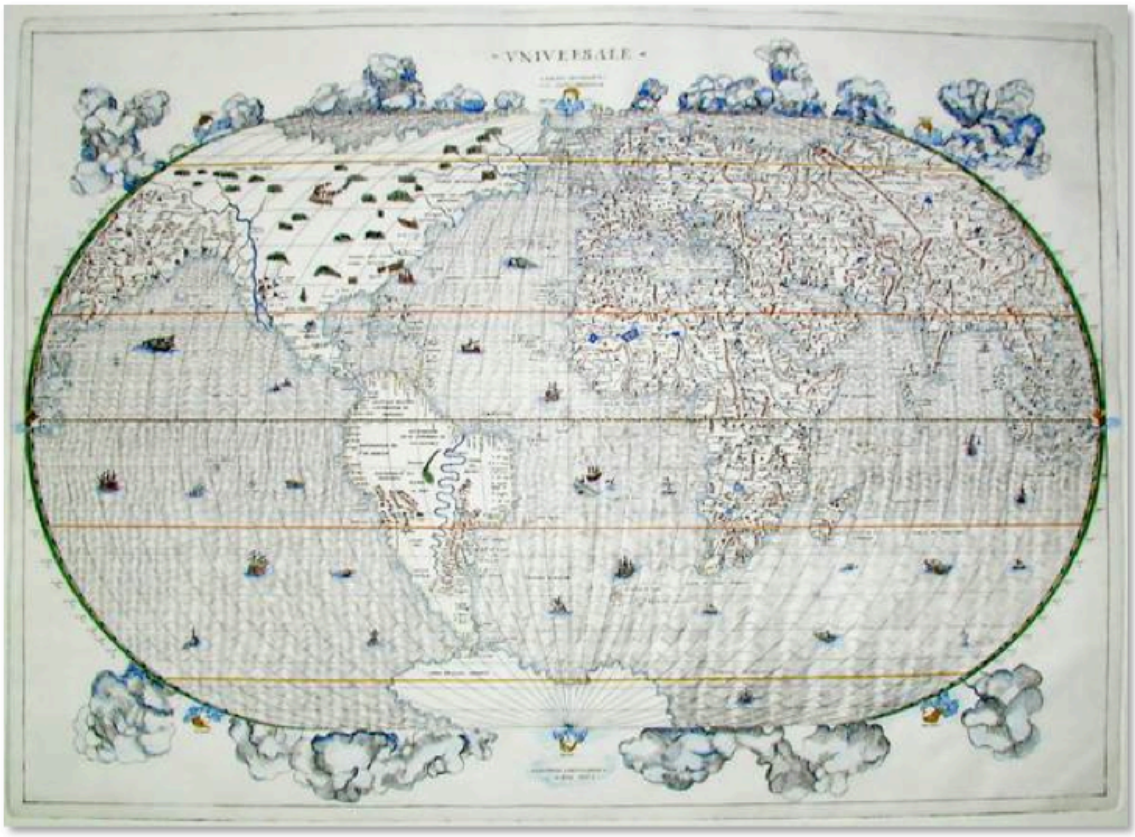
While *Jave la Grande* is not Australia, it is nevertheless the product of reconnaissance. That is to say, the geography of *Jave la Grande* found on the Dieppe maps is almost certainly based on empirical geographical data. When depicting imaginary or unfamiliar coastlines, cartographers had at their disposal a range of conventions which made it clear whether the geography was conjectural or based on empirical data: through the repetition of geographical features or lack of variance in a coastline, the way a coast was shaded or left incomplete, the lack of place names or

novelty of place names, descriptive annotations and labels, and the presence of obscuring cartouches and arbitrary embellishments. In this regard, it may be noted that *Jave la Grande* possesses all the conventions of an empirical geography.

Take the version of *Jave la Grande* on Desceliers' world map. In the *Jave la Grande* section of this geography a coastline of great variation is present, marked with rivers, shoals, and islands, and heavily labeled with place names. Compare this with the contiguous section of coastline that is familiar as *Terre Australe* (the left half). It has no geographical variation in the coastline, no indications of islands, rocks, or shoals, and minimal labeling. There is little doubt that Desceliers and his peers were basing *Jave la Grande* on empirical data, and the larger *Terre Australe* on cosmographic conjecture. So, if the Dieppe cartographers were drawing upon empirical data, the question is, what misplaced geography are we looking at?

World map by Jean Rotz, 1542

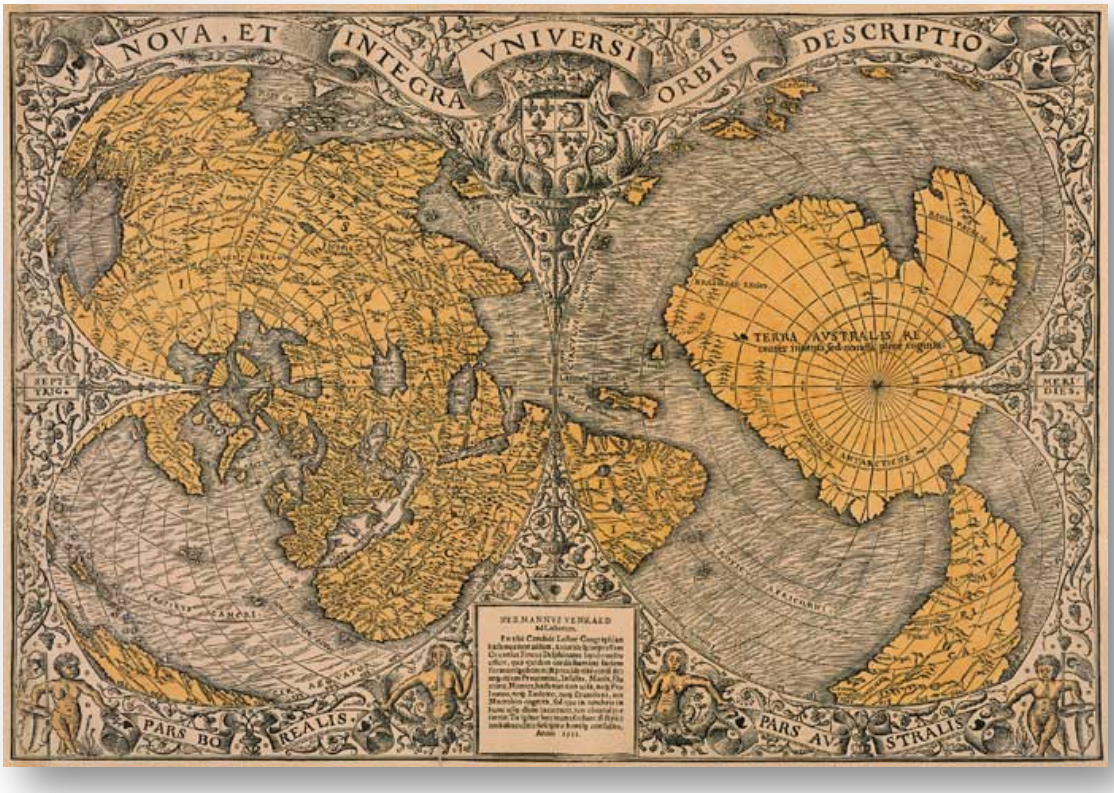
Universale Exactissma, 1555, by Gerard de Jode showing a sprawling southern continent



Universale, Giacomo Cosmographo, 1546, by Giacomo Gastaldi
showing a modest southern continent (#376) reminiscent of the Carta Marina Nova Tabula [A new sea chart {of the world], Venice, from Giacomo Gastaldi's edition of Ptolemy's Geographia, 1548 (#383)

World map by Paolo Forlani, 1565 showing Asia joined to North America and an extensive southern continent, populated with various animals (#376)

As the years passed and the southern continent appeared in an increasing number of world maps, cartographers were left with little choice but to indulge this geographical phantom. When Gerard de Jode copied this map in 1555 (shown above) he relied mostly on Gastaldi's geography and design, except for when it came to the southern continent. With de Jode, Gastaldi's modest southern landmass has become a much larger entity filling the southern latitudes from 60º S. So in size it is much more impressive than the original, though it remains geographically uninteresting, with neither geographical features nor place names to lift its slab-like appearance at the bottom of the map. The only significant embellishment is an inscription that seems to draw upon a version of the information provided by Martin Fernandez de Enciso in his *Summa de Geographia*. The inscription reads: "This as yet unexplored southern land is stated by many reputable authorities to be 350 leagues from the Cape of Good Hope." Another ten years on, Paolo Forlani has again mostly followed the Gastaldi prototype for his world map, but the southern continent is now a sprawling mass bursting with geographical features.



Oronce Fine's Nova, Et Integra Universi Orbis Descriptio, 1531, double-page woodcut double-cordiform map (#356) displaying a large southern continent.

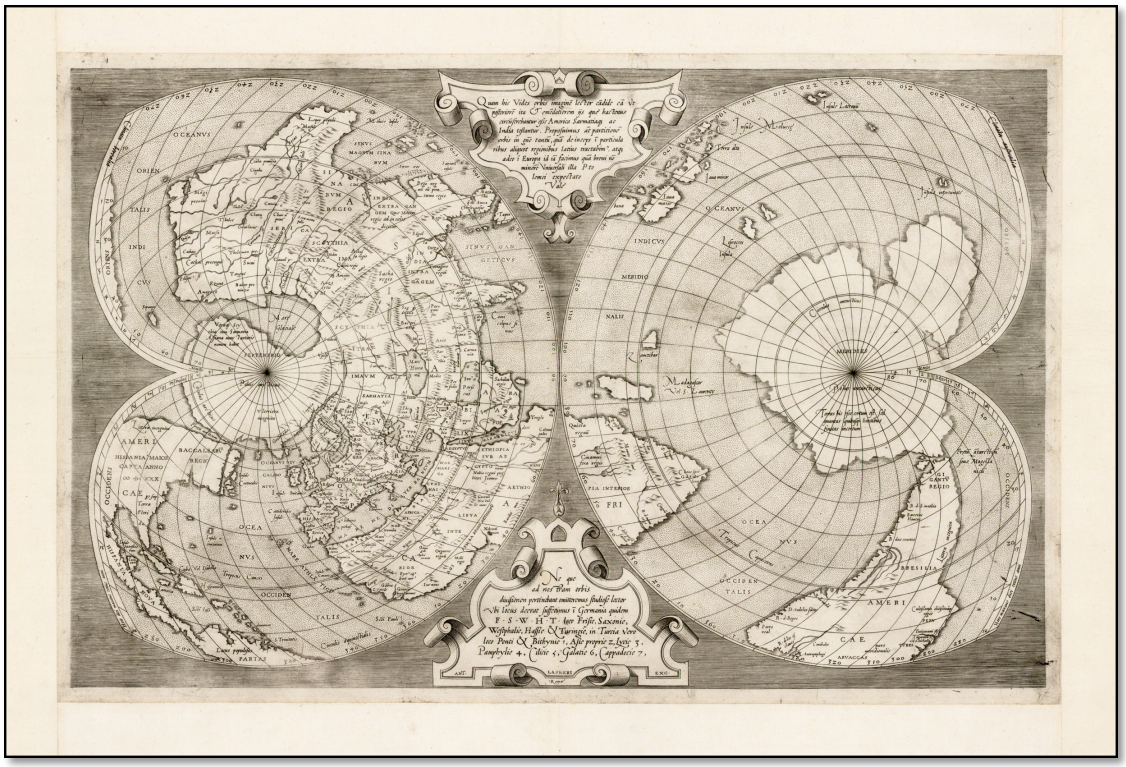
There is, in fact, many maps showing *Terra Australis Incognita* before its actual discovery in 1820, the continent that should have been there, according to the Greek philosophers from Pitagora onwards. They had figured out the earth to be spherical, and had even calculated its diameter within a good degree of precision (Erathosthenes, #*112),* in the third century B.C.), and thought that, there being lands in the northern hemisphere, there should be lands in the southern hemisphere too, lest the world be unbalanced. On the myth of *Terra Australis* a great many books have been written, and in all the studies on the history of cartography maps will be found representing the fabulous continent; which is not an ice-free Antarctica, but an imaginary land.

After the explorations following the discovery of Americas, sailors brought news of new lands being discovered farther and farther south, and this gave strength to the idea of the mythical continent really existing, to the point of it being actually included in many 16th century maps as has been shown here. In those maps, as in many others, we see *Terra Australis Incognita*, a myth not different from the one of the *Garden of Eden* (which, too, is often to be found in medieval maps), the *Prester John* reign (usually placed in East Africa, or the Far East), or *El Dorado.*

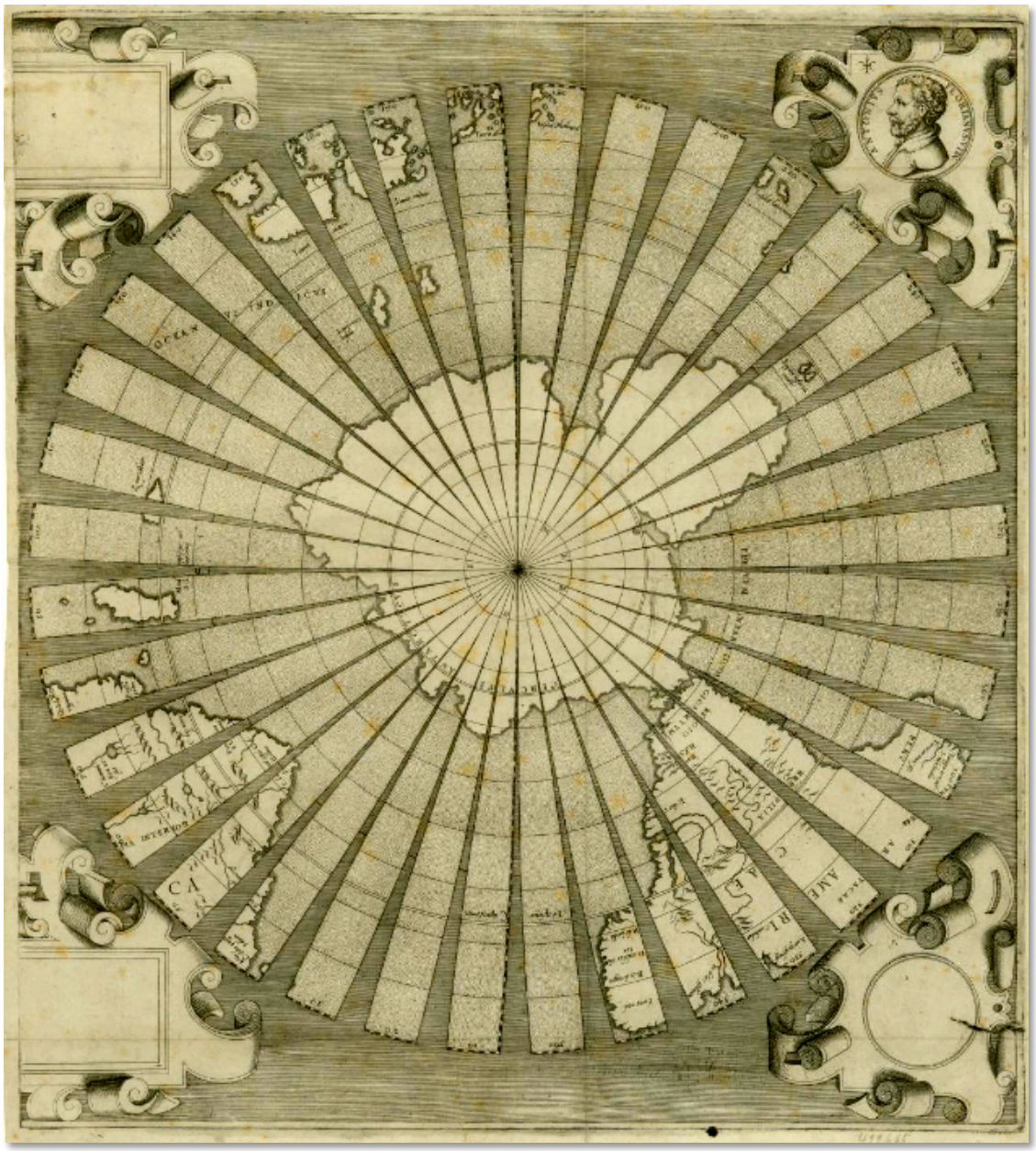
Again, Charles Hapgood in his 1966 book *Maps of the Ancient Sea Kings* (and those derivative of him) used Fine's 1531 map shown above and other maps, such as Mercator's 1538 double cordiform world map (shown below), allegedly showing Antarctica that is, at first sight, even more convincing than the *Piri Re'is* map of 1528

(#322). Hapgood and his supporters claim that it shows the Antarctic continent at the correct scale, placing the Weddell and Ross Seas as well as Queen Maud Land, Wilkes Land and Marie Byrd Land in their correct longitudes. Again, if these claims are correct, they would display an even more remarkable knowledge of the continent than that supposedly (but demonstrably not) shown by Piri Re'is.

Although there are fairly obvious similarities between the general depiction of the southern continent by Fine and modern maps of Antarctica, they do not stand up to close scrutiny; indeed, there are more differences than similarities, much as one would expect from a map drawn without genuine knowledge of the southern continent. To show that Fine's *Terra Australis* corresponds to the outline of Antarctica, it was necessary for Hapgood to rotate the depiction by about twenty degrees, move the South Pole by 7½° (1,600 km) and alter the scale, as *Terra Australis* is 230% the size of Antarctica. Hapgood used this change in scale to explain the absence of the Antarctic peninsula (Palmer Land), which he believed Fine had to omit from his map as it would have overlapped with South America at that scale; he explained that Fine confused latitude 80° S with the Antarctic Circle. Just as with his treatment of Piri Reis's map, Hapgood also had to shuffle whole sections of coastline to make them fit. It is unclear how the hypothesized original map had become fragmented and wrongly recombined; it is even more unclear how the fringe writers can go on to claim that various geographical features are shown in their correct places and at the correct scale. Again, these writers ignore what we know about the life of Oronce Fine.



Antoni Lafreri edition of Antonio Salamanca's double cordiform map of the World, first published circa 1550 in Rome. Salamanca's double cordiform map of the world is the earliest obtainable map based upon Gerard Mercator's map of 1538.



An unusual adaptation of Mercator's 1538 world map in the form of 36 globe gores by Antonio Floriano, 1556

Gerardus Mercator (1512–1594) held striking views about armchair exploration, and they come out most clearly in a passage of his cosmogonical treatise *De mundi creatione ac fabrica* (published as part of the Atlas in 1595). After discussing conceptions of the terrestrial globe influenced by scholasticism, Mercator proceeds to sketch his own view:

> Therefore, the opinion stands that the machine of the land is balanced in itself [forming a single sphere with water] ... The disposition of the center of weight and of the world implies all these things. If this had been recognized and examined by the ancients, they would have judged almost correctly concerning the situation and size of the new continent (discovered in our time) and of the southern continent that, not yet explored, lies adjacent to the Antarctic Pole. Furthermore,

> since the lands known to the ancients are contained in 180 degrees of longitude, occupying, that is, only half of a sphere, it was necessary for as many lands to exist in the other half. And since Asia, Europe, and Africa are located for the most part beyond the plane of the equinox to the north, it was necessary for such a continent to exist below the Antarctic Pole, which, along with the southern parts of Asia and the New Indies (or America), would balance the other lands.

Mercator affirmed that the unknown continent, "even though he was fully aware that it is, to date, hidden and unknown," could be demonstrated and proved "by solid reasons and arguments as yielding in its geometric proportions, size, weight, and importance to neither of the other two, nor possibly to be lesser or smaller." This implies that, for Mercator, philosophical speculation and mapping could go together, and the most prominent consequence of this is *Terra Australis*.

Mike A. Zuber in his article "The Armchair Discovery of the Unknown Southern Continent: Gerardus Mercator, Philosophical Pretensions and a Competitive Trade" (*Early Science and Medicine* 16, 2011, pp. 505-541) summarizes Mercator's contribution: "While Mercator was not the first to map *Terra Australis* in the 16th century, his contribution may be considered the most important for various reasons. First, he was the only one to develop a philosophical theory of the unknown southern continent. His predecessors, which include Monachus, Frisius and Fine, may have had similar reasons in mind but they did not, to my knowledge, expound them in any detail. Second, Mercator both designed and engraved his maps, including the 1569 world map, himself. This means that we can readily attribute changes to conscious decisions on his part, whereas in many other cases there were collaborations between at least a scholar and an engraver, which render assumptions like these questionable. Third, Mercator perused the travel literature of his day, searching for clues as to the position and outlines of *Terra Australis*. What little he found he interpreted in the light of his theory: Mercator believed that the southern continent had been sighted repeatedly on exploratory voyages. Lastly, due to his standing as an eminent authority on questions of geography, his final take on the shape of *Terra Australis*, on the 1569 world map, was taken up by others. Ortelius, in particular, included it in his *Theatrum* and thus played a vital role in establishing Mercator's southern continent as an integral part of the world picture around 1600. The *Atlas* itself featured an adaptation engraved by Mercator's son Rumold in 1587, using a different projection and fewer references to travel literature. In the caption Rumold presented the scheme of the three continents and summarized his father's theory of the unknown continent alongside the basics of geography. New Guinea is shown with the note that he was unsure whether it was an island or part of the southern continent; below the East Indies, '*Beach*'(the corruption of Marco Polo's *Loach)*, which is sometimes suggested to be the northern coast of Australia, is shown as part of the southern continent. "A mis-transcription of *Locach*, *Beach*, originated with the 1532 editions of the *Novus Orbis Regionum* by Simon Grynaeus and Johann Huttich, in which Marco Polo's *Locach* was changed to *Boëach*, which was later shortened to *Beach*. Abraham Ortelius inscribed on his 1564 world map: *Latinum exemplar habet Boeach sed male ut fere omnium: Nos italico usi fuimus* (A Latin version has *Boeach*, but mistakenly: like almost everyone we have used the Italian).

On Guillaume Le Testu's 1556 *Cosmographie Universel*, *Locach* appears to be named *La Joncade* – an island off a promontory of the southern continent, *Terre Australle*, to the eastward of *Grande Jaue*, a northward-extending promontory of the

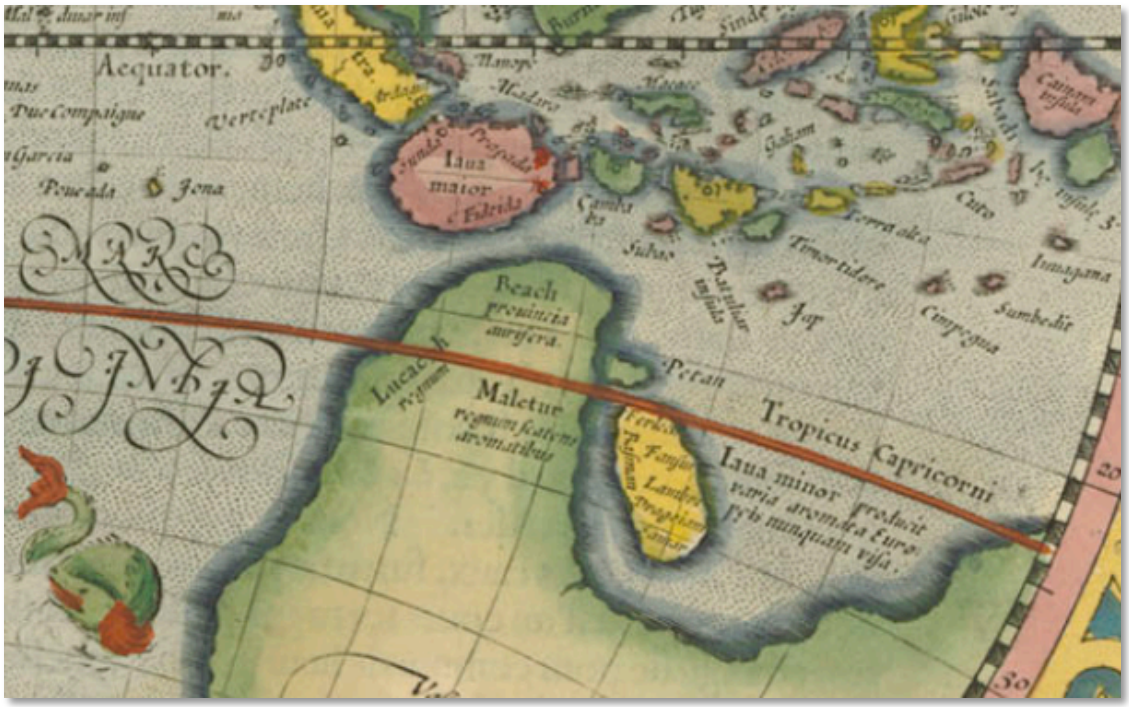
Terra Australis to the south of Java. However, some scholars see in *La Jocade* a resemblance to the North Island of New Zealand.

In the South Atlantic, a cape named *Promontorium Terrae Australis* [Promontory of the Southern Land] appeared on numerous maps from those in Ortelius' 1570 atlas onwards. It was accompanied by a long inscription on Mercator's 1569 map which gave his source, the *Sumade geographia* of 1519 by the Spanish navigator and geographer, Martin Fernandezde Enciso. The relevant passage in that book appeared to indicate the existence of a mainland southwest of the Cape of Good Hope and southeast of Cape St Augustine (near Recife in north cast Brazil). The passage, however, contains one incomplete sentence, which may well indicate the omission of one or more lines of text from the original manuscript since the latter does not seem to have survived and Enciso's source for the statement cannot be traced, it is impossible to state what land was really being referred to. Mercator, however, thinking he had found further evidence confirming what he believed, that a vast southern continent did exist, accepted at face value what Enciso appeared to have said.

The voyage of Sir Francis Drake around the world in 1577-1580 did something to dissipate the idea of a *Terra Australis*, at least in so far as concerned the concept of a continent to the southward of South America. Drake was storm-driven into that part of the ocean commonly supposed to be occupied by the unknown land, and found himself south of Tierra del Fuego in an intricate archipelago with no evidence of continental land to the south of him." The unknown maker of the celebrated world map of Paris, 1587, found in Hakluyt's edition of Peter Martyr's *De Orbe Novo*, seems to have been affected by reports of Drake's experience, as was also the maker of the Wright-Molyneux world map, published in Hakluyt's *Principal Navigations* of 1598-1600. Both these skilled and thoughtful cartographers show to the south of the Strait of Magellan a group of islands rather than continental land. Their knowledge of the Drake association with this part of the world is indicated, in the one case, by the delineation of an island west of Tierra del Fuego with the legend *Ins Reginae Elisabetae 1579 ab Anglis,* in the other, by an island south of Tierra del Fuego called *Queens Iland*. These are one and the same island. Drake sheltered at this island from the great storm that drove him southward, and upon the basis of the narrative of his voyage it was located upon many maps of the ensuing two centuries. Eventually, however, it disappeared from the maps because no one in later years succeeded in identifying or relocating it. A recent study of the subject suggests that it once occupied the position designated on today's charts as *Burnham Bank*.

Planisphere made by Rumold Mercator, 1587

Mercator likely encountered the unknown southern continent for the first time around 1536, when he was collaborating on a set of globes with Frisius and Gaspar van der Heyden. Frisius, in turn, had taken over an older project originally led by Monachus, about whom very little is known with certainty. This, it has been suggested, created a sense of rivalry that centered around the issue of whether or not Asia and America actually formed a single landmass. However, when it came to the southern continent, Monachus and Frisius agreed: neither of them doubted the existence of a vast and hitherto unknown landmass but they were also careful to point out the limits of exploration undertaken so far. Only a short time later, Mercator published his own world map (1538), which heavily borrowed from Oronce Fine's bi-cordiform *Nova, et integra universi orbis descriptio* (1531) that featured a large southern continent. Around that time, this move was by no means uncontested: as if to counteract Fine's map sometimes printed in the same volume, the cosmographer Sebastian Münster declared, "It is known that beneath the Antarctic pole there is no land, at least none that is solid and continental."



Detail: Lucach, Beach and Maletur shown on the northern extension of Terra Australis

Nevertheless, Mercator copied Fine's outline while rendering it much more tentative and also added his own inscription: "It is certain that there are lands here, yet how many and of what kind its delimiting boundaries are remains uncertain." Throughout the following years, Mercator would leave no page unturned in order to provide a more accurate map of *Terra Australis*. On the famous 1541 globe, Mercator showed the public his second take on the elusive southern continent, and it seems that his investigation of travel literature had already reached a relatively final stage. Accordingly, he was much more confident this time: "The fifth and certainly largest part, how great one may conjecture, recently joined our world, but in truth its coastline is scarcely explored until now." However, the passages Mercator cited were far from clear and required his interpretive skills, which were guided by his firm belief in the existence of the southern continent. The 1569 version of the southern continent may also have been influenced by the work of the Dieppe school *(see #378)*. Throughout the 40s and 50s, mapmakers associated with it had portrayed *Java-la-Grande* and filled it with dislocated peoples. Even though there was no real news and no more older accounts that resurfaced, Mercator's *Terra Australis* remained flexible and could thus react to his competitors in commercial cartography.

For Mercator, moreover, *Terra Australis* was not simply meta-cartographic space to be filled with text: it was also the prominent display of his insight as a philosopher-cosmographer that forced its way onto his maps."

Detail: Eastern Hemisphere

Detail: Western Hemisphere

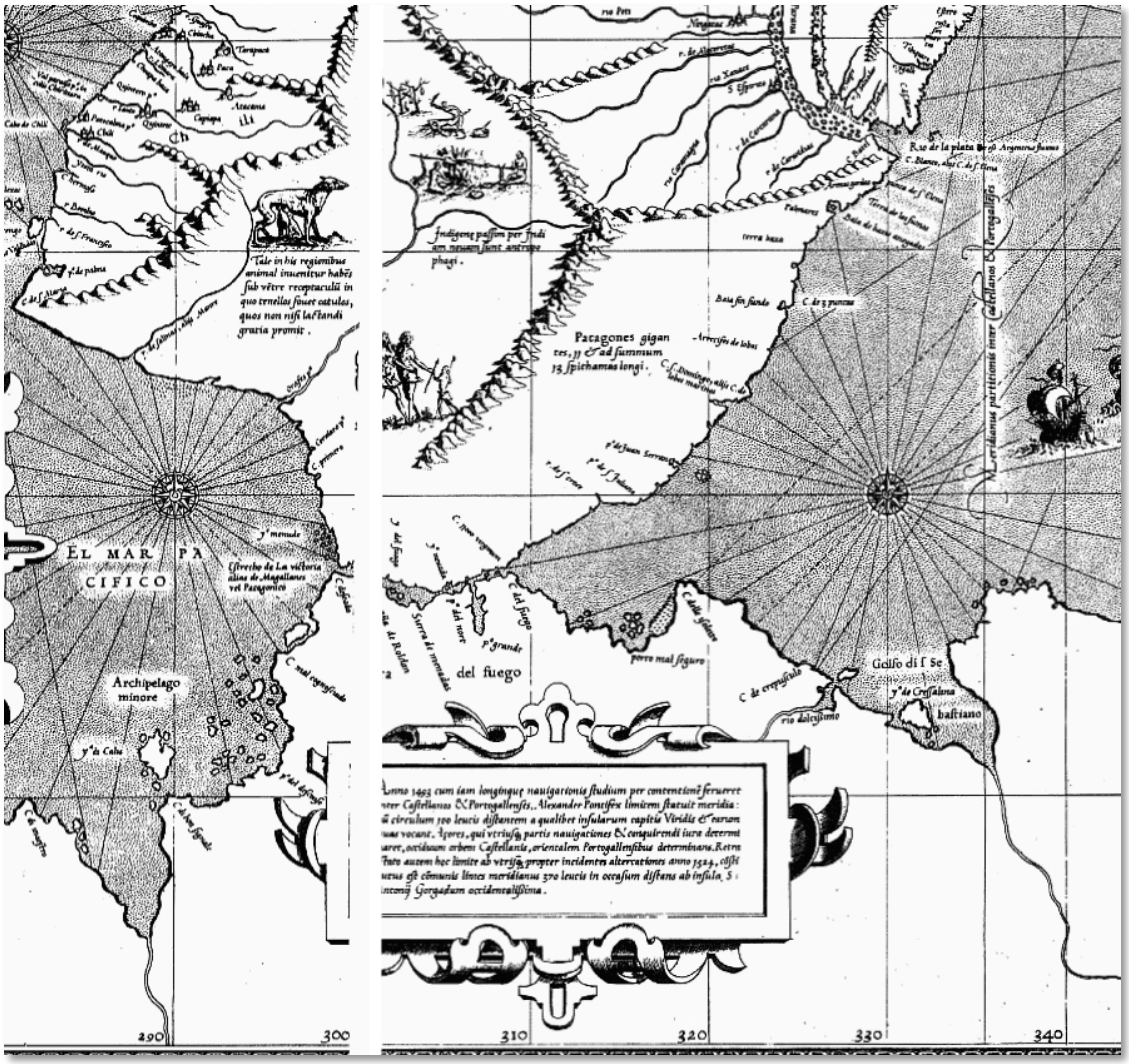
Antarctica on a facsimile of a 1560 globe by Franciscus Demongenet (#387)
Facsimile produced by Dr. D. W. Larson, Emeritus Professor

Again, as Stallard observes that good maps, maps both expert in technique and sophisticated in their development of ideas, are immensely powerful tools; one good map can change the trajectory of an entire discourse. For the southern continent, it happened with the seminal maps of Oronce Fine *(#352.1)* and Johannes Schöner *(#328),* and again with the 1569 world map of Gerhard Mercator *(#406)*.

It is commonly believed that Antarctica first appeared on Mercator's famous 1569 world map, but, as we have seen, he had actually portrayed it slightly less elaborately on globe gores in 1541. Three years earlier he had been content to copy and adapt the southern landmass on Oronce Fine's twin cordiform world map of 1531, which he may well have got to know through its publication in the 1532 Paris edition of *Novus Orbis Regionum ac Isularum Veteribus Incognitarium* [The Region of the New World and Island's Unknown to the Ancients], a compendium of travel literature edited by Simonon Grynaeus.

Mercator was convinced of the existence of the southern continent. Since Tierra del Fuego's north coast was widely accepted as part of it, and he had the apparent authority of Marco Polo for the lands south of Java, he must have tried hard to find documentary evidence to substantiate the linking of Tierra del Fuego's north coast with the coast of *Beach*, but eastwards and westwards. No such 'evidence' materialized during his lifetime nor the stretch of coastline across the South Pacific, so he adopted the common cartographic practice of his age and covered the unknown section with cartouches. Ortelius did not copy him in this regard, but placed a Latin inscription there to the effect that some people called the southern continent *Magellanic* after its discoverer.

Terra Australis sive Magellanic on Ortelius' Maris Pacifici, 1589

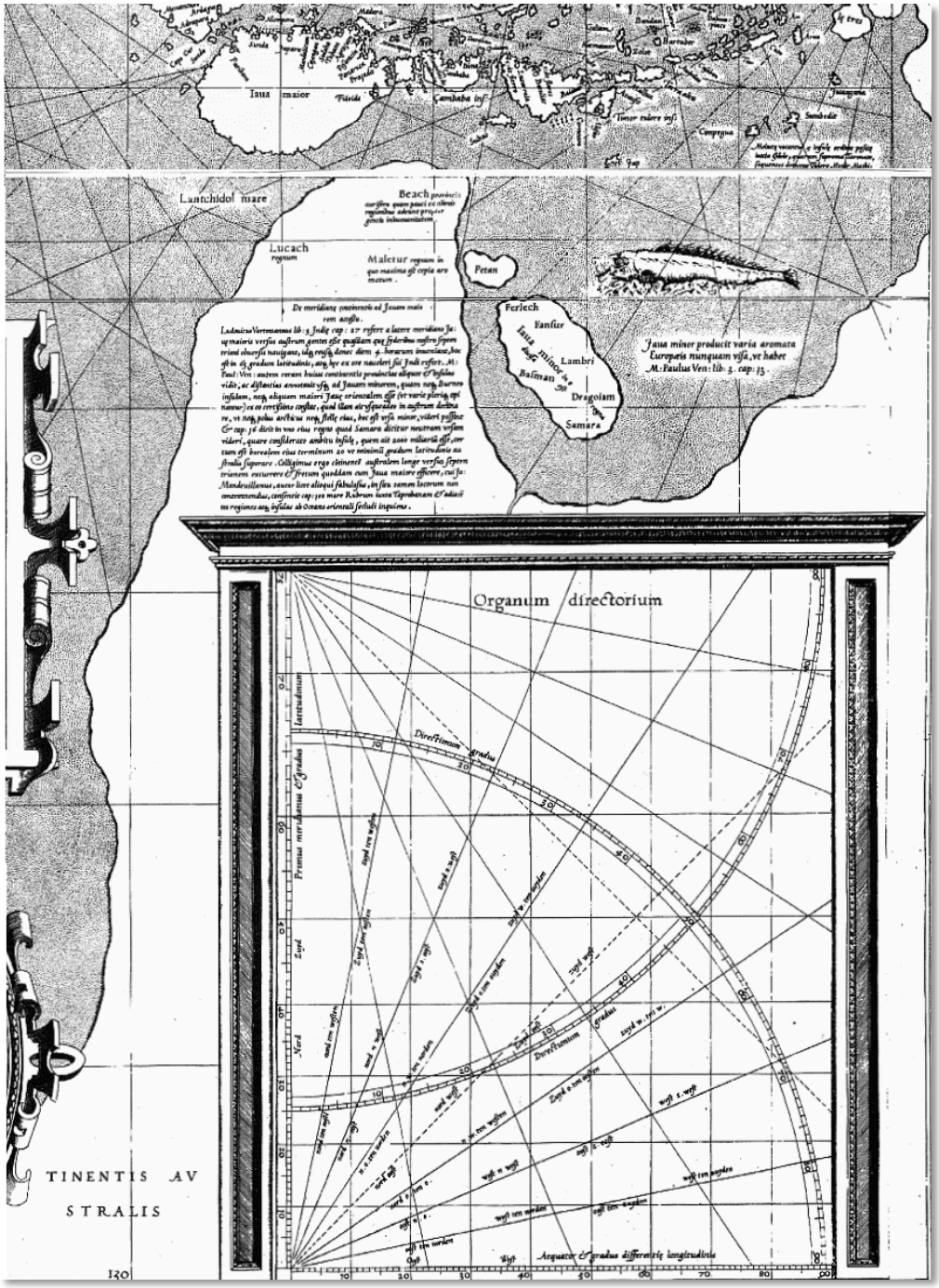


Cape Horn on the 1569 world map by Gerard Mercator (#406)

It is that southern continent, elaborated with care and detail on Mercator's 1569 world map, that solidified the forms and features of *Terra Australis*, building on the work of Schöner and Fine. Once Mercator had added his own innovations, the standard for depicting *Terra Australis* was set for the next century.

On Sheet 18 (lower right-hand corner) of his 1569 world map Mercator states: *About the approach of the southern continent to Greater Java. Ludovico di Varthema, book 3 of his India, Chapter 27, tells that on the southern side of Greater Java toward the south there are certain peoples that navigate by constellations directly opposite to our Septentriones, and this to such a degree that they find a day of 4 hours, that is, in the 63rd degree of latitude; all this he repeats from the lips of an Indian skipper of his. Marco Polo of Venice, however, saw several provinces and islands facing this continent, and noted their distances from Lesser Java. That Lesser Java is neither the island of Borneo, nor any east of Greater Java (for different men incline to one view or the other), is clear beyond question from this consideration that he says it bends so far to the south that neither the Arctic Pole or the stars, that is, Ursa Minor, can be seen; and in Chapter 16 he declares that in one kingdom of it, which is called Samara, neither Bear is visible. Therefore, if we consider the circuit of the island, which he states is 2,000 miles, it is certain the northern end of it comes about the 20th degree of south latitude. We gather,*

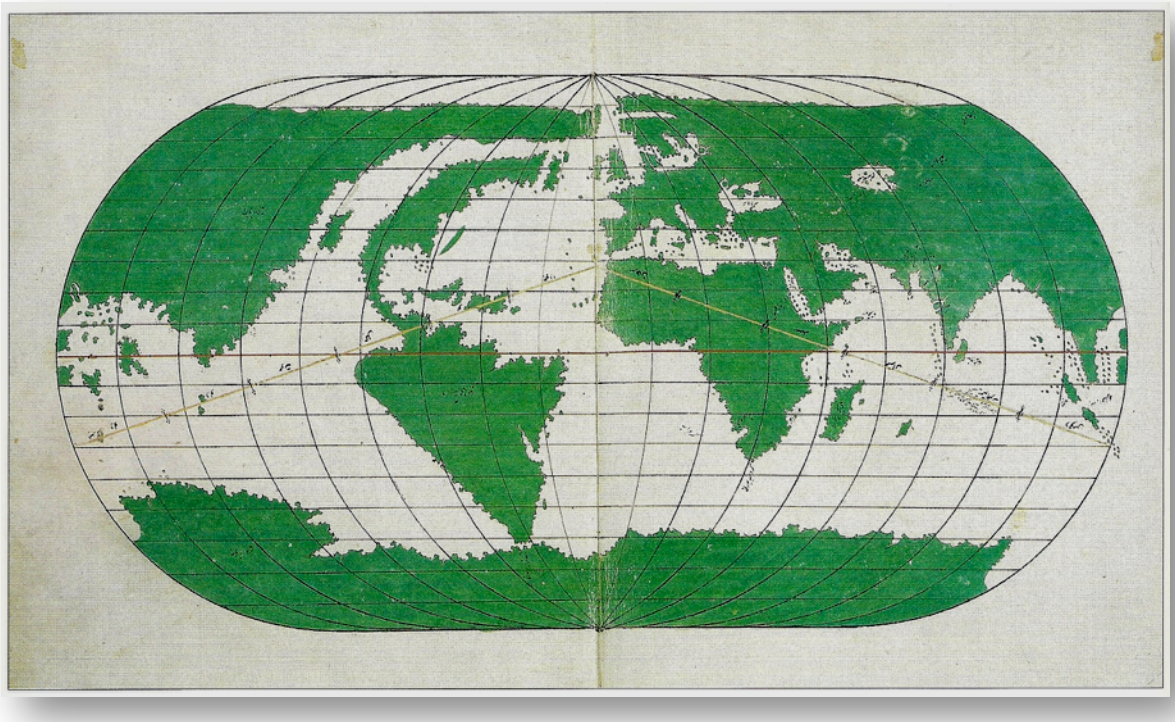
then, that a southern continent juts out far to the north, and leaves only a narrow passage of water between it and Lesser Java. Sir John Mandeville, an author inclined to tell unreliable stories, still a man not to be disregarded in the location of places, agrees with this, Chapter 103, saying that the Red Sea, near Taprobana and the neighboring regions and islands, is cut off from the Eastern Ocean.



Detail: Sheet 18 of Mercator's 1569 world map showing Beach, Lucach an Maletur and a diagram of courses

For the time being, though, the renderings of imaginative cartographers would have to suffice. In the wake of Schöner's and then Oronce Fine's maps, most cartographers of the following generation formed their depictions of the southern continent around three geographical features which became standard to cartography, namely: a coastline contiguous with South America (based on Magellan's discoveries), a region jutting into the Pacific (*Regio Patalis*), and another region stretching to just south of Java (Fine's *Brasilie Regio* which originated with Schöner).

Between 1531 and 1569—representing the years between Oronce Fine's and Gerhard Mercator's seminal world maps—the southern continent was depicted in many and varied forms often, but not always, beginning from the three standard features just outlined. Cartographers had enormous freedom in how they represented the southern continent, if they represented it at all. At their disposal was a vast expanse of unexplored space in the southern latitudes, with Tierra del Fuego the only aspect of the southern continent's geography considered fixed and settled. From that point they could be as austere or as elaborate in their depictions as they desired. To get a flavor for this variation, it is worthwhile pausing to consider a few of the more unusual and interesting variations on the theme of a southern continent produced during this period. The significance of Mercator's world map includes providing the template for maps to better serve navigation, and he also provided the template of a southern continent that dominated the southern latitudes of maps right up until the voyages of exploration that eroded its shores.



1560 world map from the "Walters Deniz Atlasi"[Walters Sea Atlas] (#407.2). Showing an extensive Antarctica and no Arctic landmass

It is a ubiquitous, deeply entrenched article of knowledge, probably because it appears straightforward and sensible: if the hemispheres are not balanced then the earth will not be stable on its axis. Deduction tells us that things are stable, therefore the earth must possess hemispheric balance. But there are serious complications with this theory—a theory that actually makes more sense in modern times than it did in Mercator's. Today we are likely to perceive balance as an issue pertaining to the revolution of the earth about its axis. If the hemispheres were unequal, then, like a lop-sided spinning-top, the earth would have a wobbly rotation. This is how the Enlightenment thinker Charles de Brosses understood *equipoisure* in the 18th century, and it makes intuitive, if not perfect scientific, sense. The only problem with this conception of imbalance is that it has no applicability whatsoever to ancient Greek philosophers or to Mercator. Neither Mercator nor the vast majority of his contemporaries believed that the earth rotated about an axis; their earth was stationary at the center of the universe. Cosmologists and astronomers had seemingly confirmed this with their observations and theories, but more importantly it was writ large in the Christian Bible. Multiple passages tell of the earth's immobility. Psalm 104:5: "Who laid the foundations of the earth, that it should not be moved for ever." Job 26:7: "He stretcheth out the north over the empty place, and hangeth the earth upon nothing." Conversely, the Bible tells of the sun's mobility. Ecclesiastes 1:5: " e sun also ariseth, and the sun goeth down, and hasteth to his place where he ariseth." Faced with this body of authority, how could one claim to be a Christian and believe that the earth rotated, and orbited the sun?

As Stallard points out the practicalities of the 16th and 17th centuries meant that whenever a cartographer offered up what appeared to be a superior mapping of a region—remembering that what might appear to be an advance in the state of knowledge could just as well be the product of interpolation, error and invention—other cartographers were quick to appropriate that information. This informal system of cartographic plagiarism contravened the same basic precepts of intellectual property as exist today, but it was nevertheless common practice and largely accepted as a fact of life by the cartographic community.

The result was that the basic Mercatorian image of the southern continent became a standard of world and hemispheric maps throughout the next century (and remnants of it remained in various guises throughout the late 17th and 18th centuries). Thus, everyone interested in geography in the late 16th century was inundated with consistent representations of the southern continent across a variety of geographical mediums—in geography and cosmography texts, narratives of exploration, maps of the world and so on. There was no escaping the imperious presence of *Terra Australis*—even as it continued to carry the label, *nondum cognita*.

As mariners were sent in search of the southern continent its boundaries were pushed further and further south. Francis Drake was sent by Elizabeth I to look for *Terra Australis*; others followed: Abel Tasman in the 1640s, the Frenchman Antoine de la Roche in the 1670s and Edmond Halley in the 1680s, the latter said to be the first European to see icebergs in the southern hemisphere.

Against this backdrop, Stallard observes that belief came to be invested in the existence of the southern continent, but, importantly, not unconditionally in the cartography of the southern continent. To be sure, the cartography of the southern continent played a major role in the southern continent's acceptance as a geographical entity by making it both tangible and compelling. Maps were a medium that spoke to

people of all inclinations and varying degrees of knowledge and literacy. To see *Terra Australis* on the map was to see an entity on the cusp of knowledge—real but unknown. However, it is important to not make the mistake of assuming that the cartography of the southern continent was assumed to be a representation of reality itself. It was not. The crux of this point boils down to two intimately related propositions: that the early moderns were rational agents who well knew that the southern continent depicted on maps was in large part conjectural and provisional, and that the early moderns nevertheless had faith that this unknown land did exist. In the simpler words of Joseph Hall, "this it is, yet we know it not." In subscribing to such a potentially inconsistent worldview, the early moderns collapsed the dichotomy separating what exists from what is known into a spectrum of the real, the probable and the possible. Alfred Hiatt, in his *Terra Incognita* elaborates:

> At first glance the proposition that geographers were unable to distinguish false from true information, and consequently represented the fictional as well as the real on their maps, seems self-evident. But ... the opposition between true and false risks misunderstanding and misrepresenting 16th century geography. I do not mean that mapmakers of the era did not distinguish between truth and falsehood, or that they were uninterested in true representations, or unconcerned to eliminate false information from their maps; on the contrary. However, they operated primarily on axes slightly different to that of truth–falsehood: 16th century geographers, like their medieval counterparts, dealt in certainties and uncertainties, distinguishing between probabilities and improbabilities, the attested and the unattested ... the unknown southern land might have been a fiction, but its shape and features were not random: they were the result of careful consideration and interpretation, however speculative.

After this period, when the potential bounds of the southern continent were being progressively eroded by exploration, the map's work had been done. It mattered little that the southern continent was no longer recognizable by the time of Captain James Cook. To quote Captain Cook: "I have now made the circuit of the Southern Ocean in a high Latitude and traversed it in such a manner as to leave not the least room for the possibility of there being a continent, unless near the Pole and out of the reach of Navigation; by twice visiting the Pacific Tropical Sea, I had not only settled the situation of some old discoveries but made there many new ones and left, I conceive, very little more to be done even in that part. Thus I flater my self that the intention of the voyage has in every respect been fully answered, the Southern Hemisphere sufficiently explored and a final end put to the searching after a Southern Continent, which has at times engrossed the attention of some of the Maritime Powers for near two Centuries past and the Geographers of all ages." The idea of its existence had been cemented into geographical thinking, such that long after retrospect suggests it should have been discarded it continued to influence the imagining and exploring of the southern hemisphere.

A continent as vast as Europe, Africa and Asia combined; a land abounding with spices, gold and all manner of natural riches; a civilization of millions awaiting the salvation of a Christian God. Such was *Terra Australis*, the locus for a suite of ideas so compelling that from the latter half of the 16th century this imagined geography began to figure in the machinations of explorers and entrepreneurs in its own right. And, indeed, well it might: the European powers were running out of new territories to exploit in the better-known regions of the world, whereas the potential of *Terra*

Australis remained completely untapped. If found to exist as it had been imagined, what a prize the southern continent would be: fame and glory would redound to its intrepid discoverers, and kings, queens, and their powerful merchants would possess a bounty of inestimable value. But while the British, French, Portuguese and Dutch were still contemplating the merits of sending an expedition to discover the southern continent, the Spanish, spurred by Incan knowledge of gold-rich Pacific islands, and conscious of their unique obligation to deliver salvation to godless heathens, decided to act. In 1567 they launched the first of three expeditions in search of *Terra Australis*, in doing so heralding a new era where the imagination of cartographers and cosmographers was put on a collision course with geographical reality. All three of these Spanish expeditions failed to find the illusive southern continent.

During the first half of the 17th century the Dutch pursued two objectives. The first was the exploration and better discovery of the *South-land* that they had come upon largely by accident to the south of Java. This was the geographical entity of Australia, though for around a decade the Dutch believed that this was the land of *Beach*, a promontory of the much sought-after southern continent. The second objective was to discover the *South-land* which the Dutch believed filled the southern hemisphere in the higher latitudes, and which, as their geographical knowledge expanded, they realized must be a separate entity to the lands they had already discovered south of Java. This was the geographical entity known as *Terra Australis*. The stories of these two geographical entities cannot be separated, but as the Dutch soon established, the entities themselves can be.

Stallard states that the mechanism at play here is evident in all early modern geographical knowledge. Preconceptions form the filter through which data is observed and interpreted in the first instance, after which that data, already mediated, is conveyed to the wider community of scholars, merchants, bureaucrats and the general populace where it is further interpreted according to geographical ideas, expectations and the latest geographical knowledge (itself a composite of perception and interpretation). In this sense, pure, unadulterated empirical data simply does not exist, in which case neither does unmediated geographical knowledge.

Damage was done to the substance of *Terra Australis* in the wake of the Dutch voyages touching on the shores of Australia, culminating in Tasman's 1642 expedition. Traversing the 40th parallel south of Australia, Tasman sailed right through the mythical continent so many cartographers depicted on their maps, finding only open seas where land was expected. Knowledge of Tasman's expedition eventually circulated, the implications were enormous. In one fell swoop any prospective promontory of *Terra Australis* south of Java and New Guinea was excised. Where other voyages had merely eroded the imagined coasts of *Terra Australis* and forced cartographers to depict that land beyond the horizon of knowledge—the essentials of the geography intact—Tasman's discoveries necessitated a more comprehensive remodeling, as cartographers had little choice but to amputate the equivalent of at least ten million square kilometers from the archetypical Mercatorian continent. It was very nearly the death knell for *Terra Australis*, but advocates refused to let this cosmographic postulate wither away as a hopeless fantasy. Despite the increasing ranks of doubters, despite the overwhelming evidence of non-existence, and despite the cosmographic gymnastics remodeling required, tradition proved more potent than ugly fact. It was no longer the same lustrous continent bequeathed

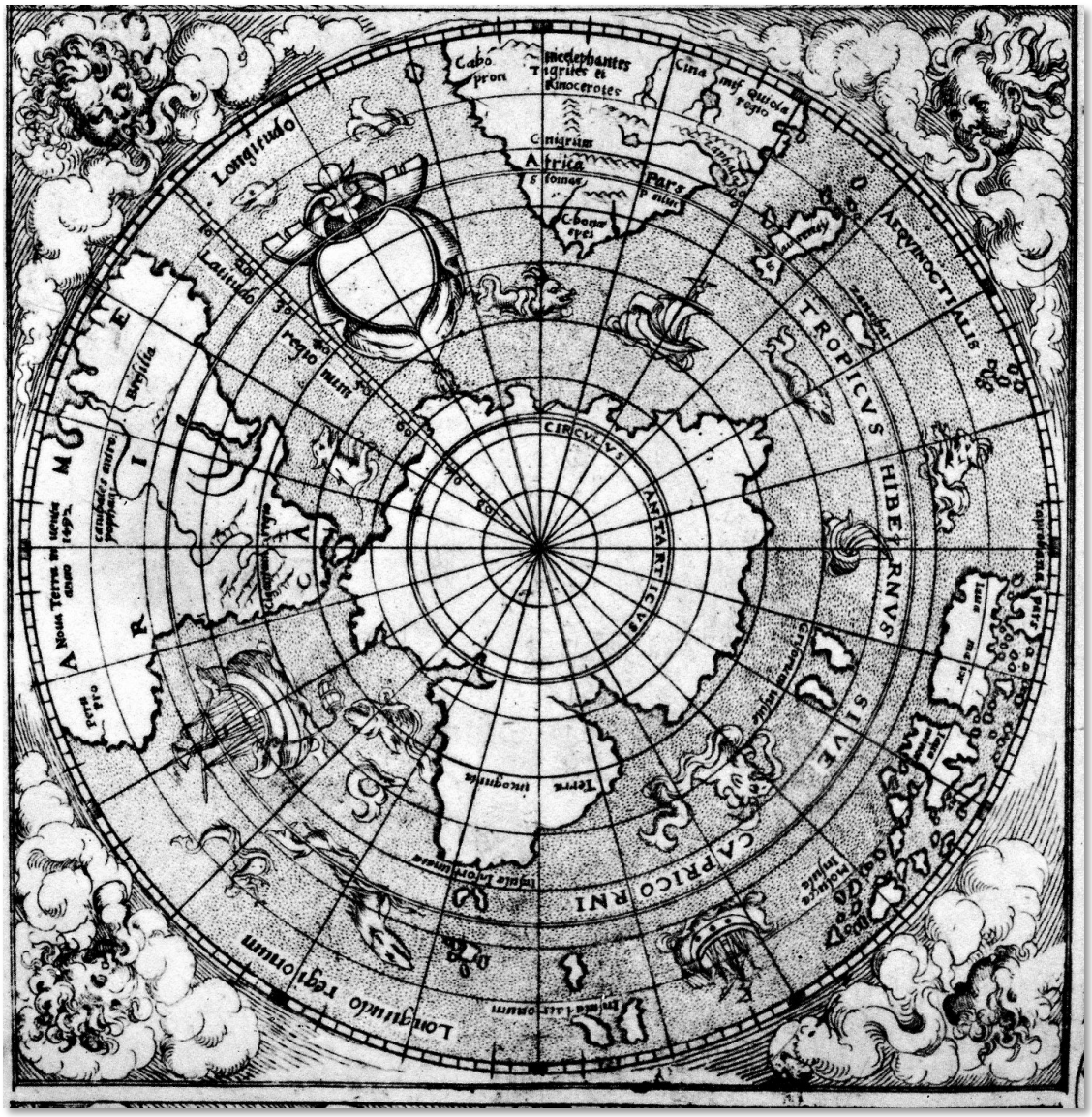
by Fine and Mercator, and it was no longer as fervently lusted after in the imaginations of sundry men; but *Terra Australis* was a fundament of cartography and cosmography, and it would rebound time and again from acts of empirical falsification until explorers could prove, outright, that a southern continent could not exist in any meaningful fashion. *Terra Australis* ailed, but continued to endure.

In 1767, the British scientist Alexander Dalyrymple published a summary account of existing descriptions and reports of the Great Southern Continent - *An Account of the Discoveries made in the South Pacifick Ocean previous to 1764*. The Admiralty decided to investigate, and dispatched James Cook with orders to search for the southern continent, by sailing as far south as was possible. The expedition, Cook's second (1772-1775) comprised two ships, Cook's *Resolution* and Tobias Furneaux's *Adventure*. On 17 January 1773, the *Resolution* became the first ship to cross the polar circle, and the following year reached 71°10′ S latitude, the most southerly point yet reached.

Unfortunately, Cook was greatly handicapped by the prevailing climate. Because of the unusually cold weather, the pack ice around Antarctica extended further north than usual, and on many occasions Cook found his passage blocked by icebergs. In the end, despite his best efforts, Cook never found the Antarctic continent but, in his attempts to find passage, had circumnavigated it, with the resultant maps once again greatly reducing the perceived size of the continent.

No one can be sure who actually saw Antarctica first; the probability is that it was one of the numerous sealer ships that descended on the region in the last quarter of the 18th century. Whoever it was may not have realized the significance of their sighting. In the absence of a record, official recognition is claimed by a number of individuals in 1820, among them a Royal Navy officer Edward Bransfield who espied in the distance, the north-western part of the Antarctic peninsula on 30 January 1820 and the Russian scientist Thaddeus von Bellingshausen, who was the second mariner to circumnavigate Antarctica.

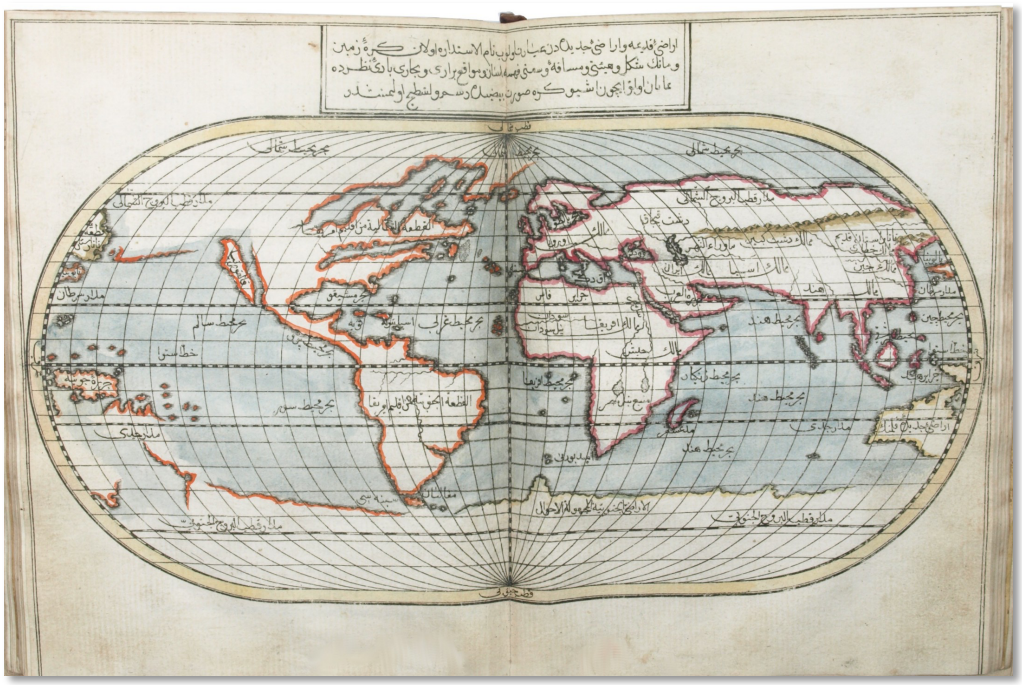
A number of later voyages through the late 1700s charted many of the waters into which *Terra Australis* was thought to extend, and either reduced or eliminated it from maps altogether. It was not until 1820 that a confirmed sighting of Antarctica did occur. Even so, the centuries-long cartographical transformation of *Terra Australis* into Antarctica is a fascinating record of the evolution of modern geography.



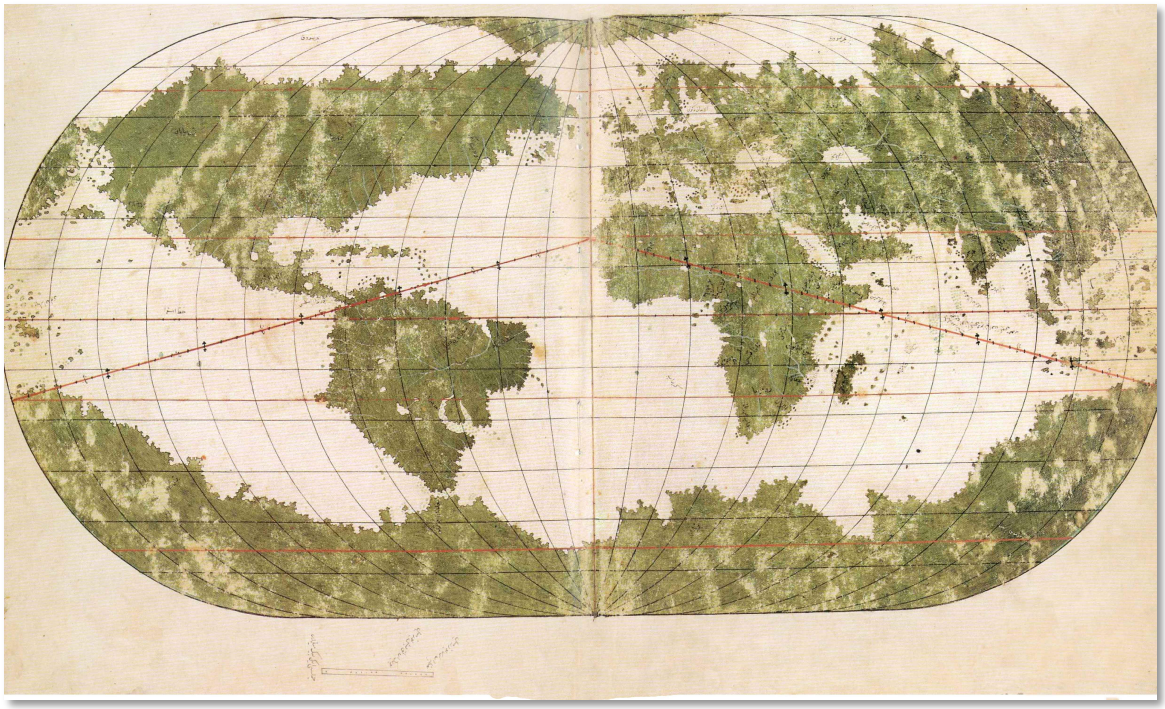
South polar map by Jost Amman, 1564

The extreme limit of credulity in respect to the *Terra Australis* was reached in the second half of the 16th century after the idea had been nurtured by two generations of cartographers. In the well-known map *Americae sive Novi Orbis*, found in the *Theatrum* of Abraham Ortelius, of 1570, the southern continent crosses the Pacific from the tip of South America, joins the land mass believed to lie south of New Guinea, and runs northward almost to the equator with New Guinea as its northernmost extension. In the world map, the *Typus Orbis Terrarum*; in this same atlas and the edition of 1587, the southern continent runs entirely around the world, occupying an area greater than that of North and South America combined. Here was the complete expression of the idea of the balancing of weights necessary to the equilibrium of the earth. Among the later maps in which the southern continent is portrayed as fully encircling the globe are the world map and western hemisphere map found in the *Ta' rikh al-Hind al-Gbarbi*, a description of the New World in the Turkish language, printed at Constantinople in 1730. Upon the southern continent in the nicely rendered

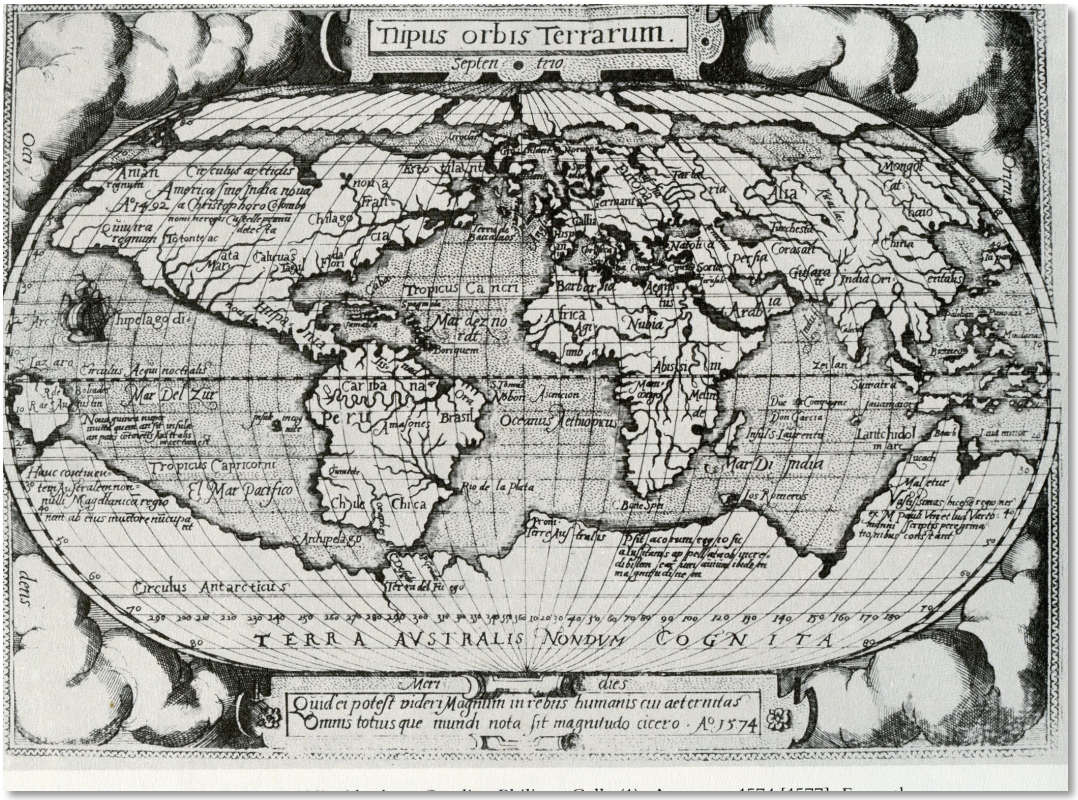
copperplate world map in this rare book, appears a legend designating this area as the "land of unknown conditions".



The Ta' rikh al-Hind al-Gbarbi, a description of the New World in the Turkish language, printed at Constantinople in 1730



Ali Macar Reis map, 1567, Topkapı Sarayı Müzesi Kütüphanesi, H. 644. fols. 7b-8a. This 16th century Ottoman world map depicts Antarctica as an enormous landmass (#407.2)



1574 world map by Abraham Ortelius showing the four-island North Pole and Terra Australis [Antarctica] as an extensive landmass reaching almost to the equator

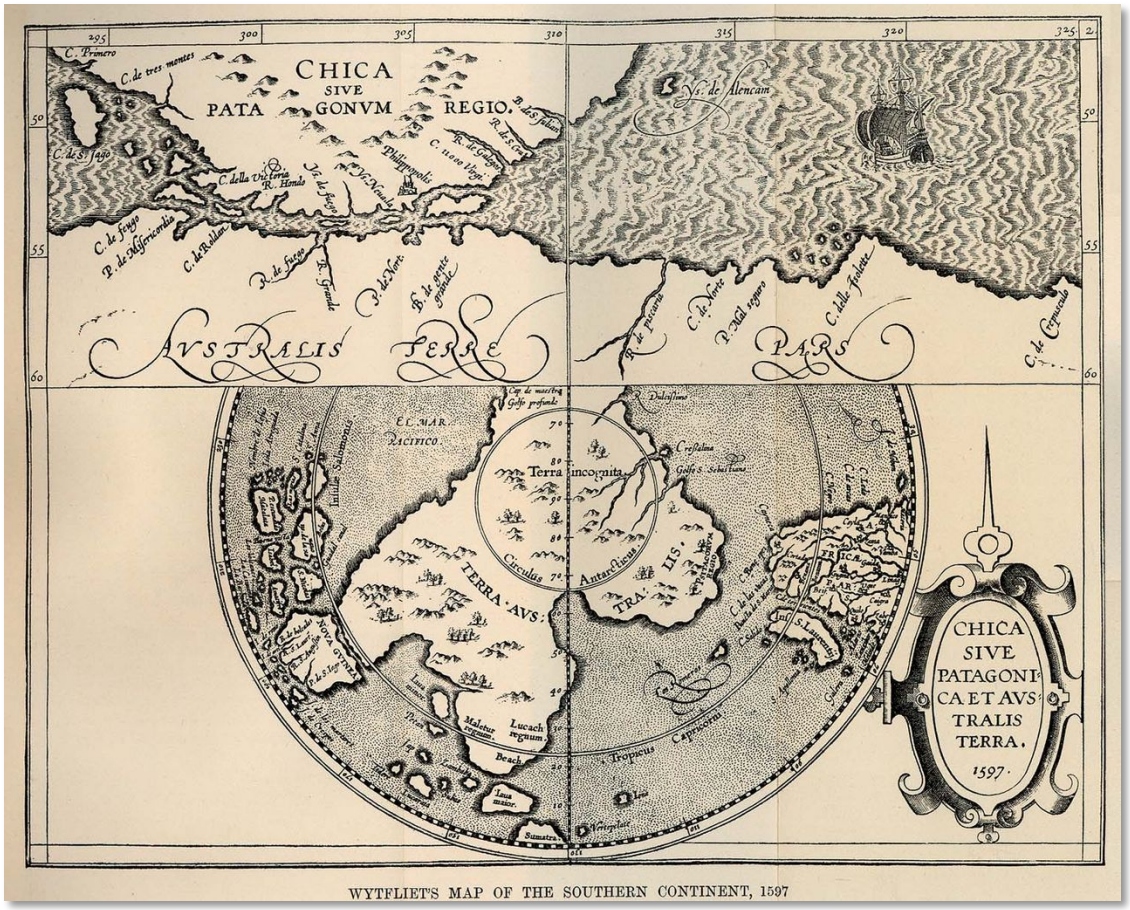
Antarctica on a facsimile of the 1577 globe Marius Cartarus Viterbiensis autor incidebat Romae MDLXXVII cum privilegio, by Mario Cartaro of Rome (#415.2)
Facsimile produced by Dr. D. W. Larson, Emeritus Professor
University of Guelph, Guelph, Ontario, Canada

Map of Antarctica by Jacques de Vaux, 1583

One of the most famous maps on which *Terra Australis* first appears forms a central segment of the world's first modern atlas. Flemish cartographer Abraham Ortelius' renowned *Theatrum Orbis Terrarum* [Theater of the World] is a compendium

of all the latest maps drawn by his contemporaries, representing the sum of 16th century cartographical knowledge.

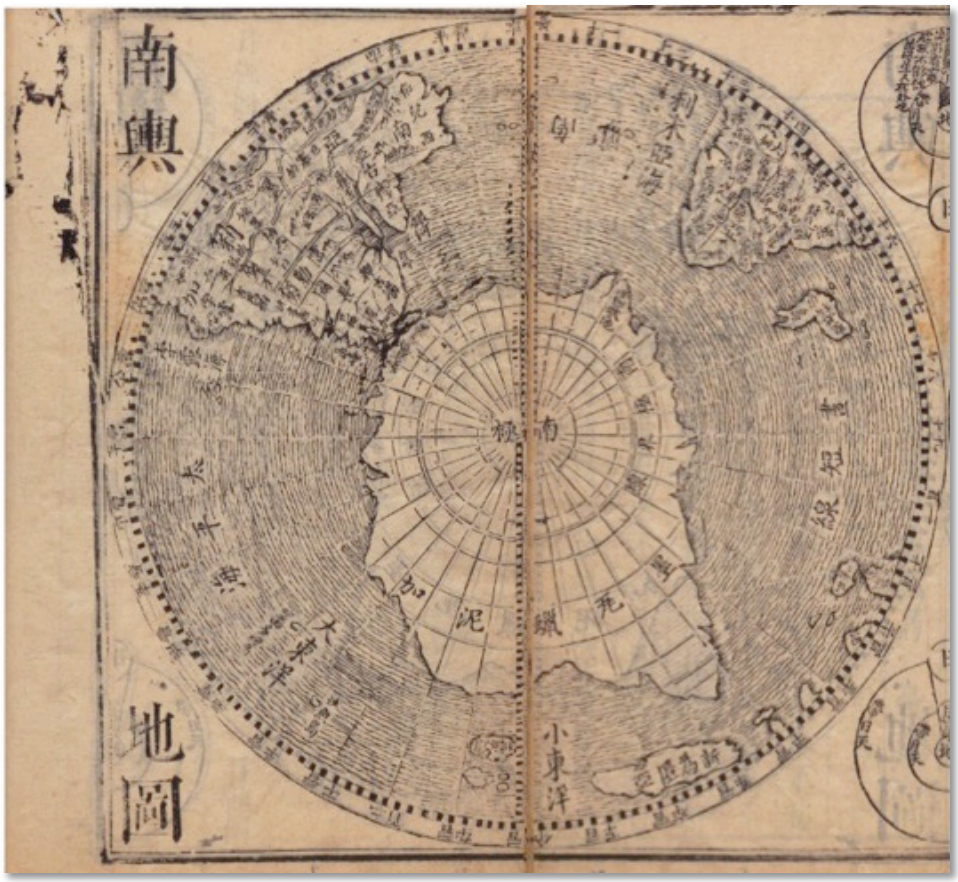
Abraham Ortelius is among the most famed mapmakers of the Dutch golden age of cartography, which occurred between the 16th and 17th centuries. Among the chief sections of his atlas is the *Typus Orbis Terrarum*, a world map that, like the Ottoman maps shown above, depicts *Terra Australis* as being by far the largest landmass in the known world: It fills most of the space south of the Tropic of Capricorn, nearly touching the southern tip of South America, and extends all the way to New Guinea. Ortelius' atlas, a pivotal development of world geography, was a mainstay of navigation and was regularly updated over the ensuing decades. The extreme limit of credulity in respect to the *Terra Australis* was reached in the second half of the 16th century after the idea had been nurtured by two generations of cartographers. In the well-known map *Americae sive Novi Orbis*, found in the *Theatrum* of Abraham Ortelius, of 1570, the southern continent crosses the Pacific from the tip of South America, joins the land mass believed to lie south of New Guinea, and runs northward almost to the equator with New Guinea as its northernmost extension. In the world map, the *Typus Orbis Terrarum*, in this same atlas and the edition of 1587, the southern continent runs entirely around the world, occupying an area greater than that of North and South America combined. Here was the complete expression of the idea of the balancing of weights necessary to the equilibrium of the earth.



WYTFLIET'S MAP OF THE SOUTHERN CONTINENT, 1597

The Flemish geographer and cartographer, Cornelius Wytfliet, wrote concerning the *Terra Australis* in his 1597 book, *Descriptionis Ptolemaicae Augmentum*:

> The *Terra Australis* is therefore the southernmost of all other lands, directly beneath the Antarctic Circle; extending beyond the tropic of Capricorn to the West, it ends almost at the equator itself, and separated by a narrow strait lies on the East opposite to New Guinea, only known so far by a few shores because after one voyage and another that route has been given up and unless sailors are forced and driven by stress of winds it is seldom visited. The *Terra Australis* begins at two or three degrees below the equator and it is said by some to be of such magnitude that if at any time it is fully discovered they think it will be the fifth part of the world. Adjoining Guinea on the right are the numerous and vast Solomon Islands which lately became famous by the voyage of Alvarus Mendanius.



Orbis Terrae Novissima Descriptio Authore Gerardo Mercatore . . .
by Jodocus Hondius and Jean le Clerc, 1602

Juan Fernandez, sailing from Chile in 1576, claimed he had discovered the Southern Continent. The *Polus Antarcticus* map of 1641 by Henricus Hondius, bears the inscription: *Insulas esse a Nova Guinea usque ad Fretum Magellanicum affirmat Hernandus Galego, qui ad eas explorandas missus fuit a Rege Hispaniae Anno 1576* (Hernando Gallego, who in the year 1576 was sent by the King of Spain to explore them, affirms that there are islands from New Guinea up to the Strait of Magellan). On this map by Hondius a large promontory extending northwards from *Terra Australis* is highly suggestive of the western coast of Australia. The lands of *Maletur* and *Beach* from the travel account of Marco Polo are noted along the coast. While this edition of Hondius' map post-dates the official discovery of Australia in 1606 by Dutchman Willem Janszoon, the first 1602 edition, which also included the promontory, did not. Most likely Mercator extracted information about Australia from the Dieppe maps, which were believed to have been derived from secret now lost Portuguese maps.

Examining *Polus Antarcticus*, it is evident that the coastline of *Terra Australis* fractures at longitudes to both the west and east of Australia; Henricus Hondius has not attempted to connect the empirical data with the southern continent, thus establishing a clear delineation between the empirical and the conjectural. To the east of Australia (on the left of the map) it is also clear that the coastline of *Terra Australis* is, in fact, comprised of an island chain, rather than an unbroken littoral. The impetus for this island chain came directly from Jodocus' father, who pioneered such a feature on his 1602 world map. Hondius' adoption of the island chain is especially interesting because this new geography still conforms to the old: Hondius has conflated the notion of an island chain with the South-land coastline—so while there is no actual

mainland coast, the island chain exactly conforms to the layout of the former South-land coastline as depicted in his own maps and those of Abraham Ortelius. The island chain is, then, a fragmenting and islandification of what was the *South-land* littoral. A close examination of *Polus Antarcticus* reveals that Hondius has also turned the *South-land* coastline beneath Africa into a second extensive island chain. This is a technique employed to convey doubt. Island chains, coastal fragmentation, unbounded landmasses and shadowed or faded coastlines were all employed as cartographic indicators of geographical uncertainty, the equivalent of the literary question mark or ellipsis. Hondius' map is, then, a compromise: between empiricism and aesthetics, between knowledge and expectation. Hondius perpetuates *Terra Australis*, but he is no advocate.

As time passed and additional exploration reports came in, the Hondius publications under Henricus resulted in a totally different look as shown below.

Matthias Quadus, 1608

Detail: showing both place-names Beach and Lucach on a northern promontory of Terra Australis

The question of the existence of a land mass south of Magellan's Strait was not cleared up by the Schouten-Le Maire expedition of 1616, in which for the first time the Pacific was entered from the Atlantic by the rounding of Cape Horn, nor was the question greatly clarified by the book and map of the Nodal brothers, sent out by the King of Spain in 16 I8 to examine the Le Maire strait and study the possibility of maintaining control over this new passage into the Pacific. The existence of the southern continent was so strongly fixed in the minds of men of the time that they held on to it even after Le Maire and Schouten had proved Tierra del Fuego to be an island. In its place as the promontory of the *Terra Australis* the geographers now set up the small island, *Staten Landt*, which formed the eastern shore of the new-found Le Maire Strait. Once around the Horn the Dutchmen sailed northwestward across the Pacific and explored the northern coast of New Guinea, incurious, it seems, about the continent that they supposed lay south of their strait. The Nodals passed around the Horn through Le Maire's strait, turned northward, and sailed back to Spain by way of the Strait of Magellan. They designated *Staten Landt* as "*la tierra Incognita*" and showed it on their rare map with an indefinite eastern extension. In his expedition against the west coast of South America in 1643, Hendrik Brouwer was driven out of Le Maire's strait and forced to round *Staten Landt* from east to west, proving clearly that it was a small island and not the tip of the austral continent. But belief in the existence of a southern continent was so ingrained in the seamen and geographers of this generation that it was affected hardly at all by the experiences of Drake and Brouwer and only confirmed by those of Le Maire and the Nodals.

World map by Joseph Hall, 1605 with a vast fictitious southern continent Mundus after et idem siue Terra Austrafis ante hac semper incognita fongis itineribus peregrini Academici nuperrime fustrata I Auth: Mercurio Britannico

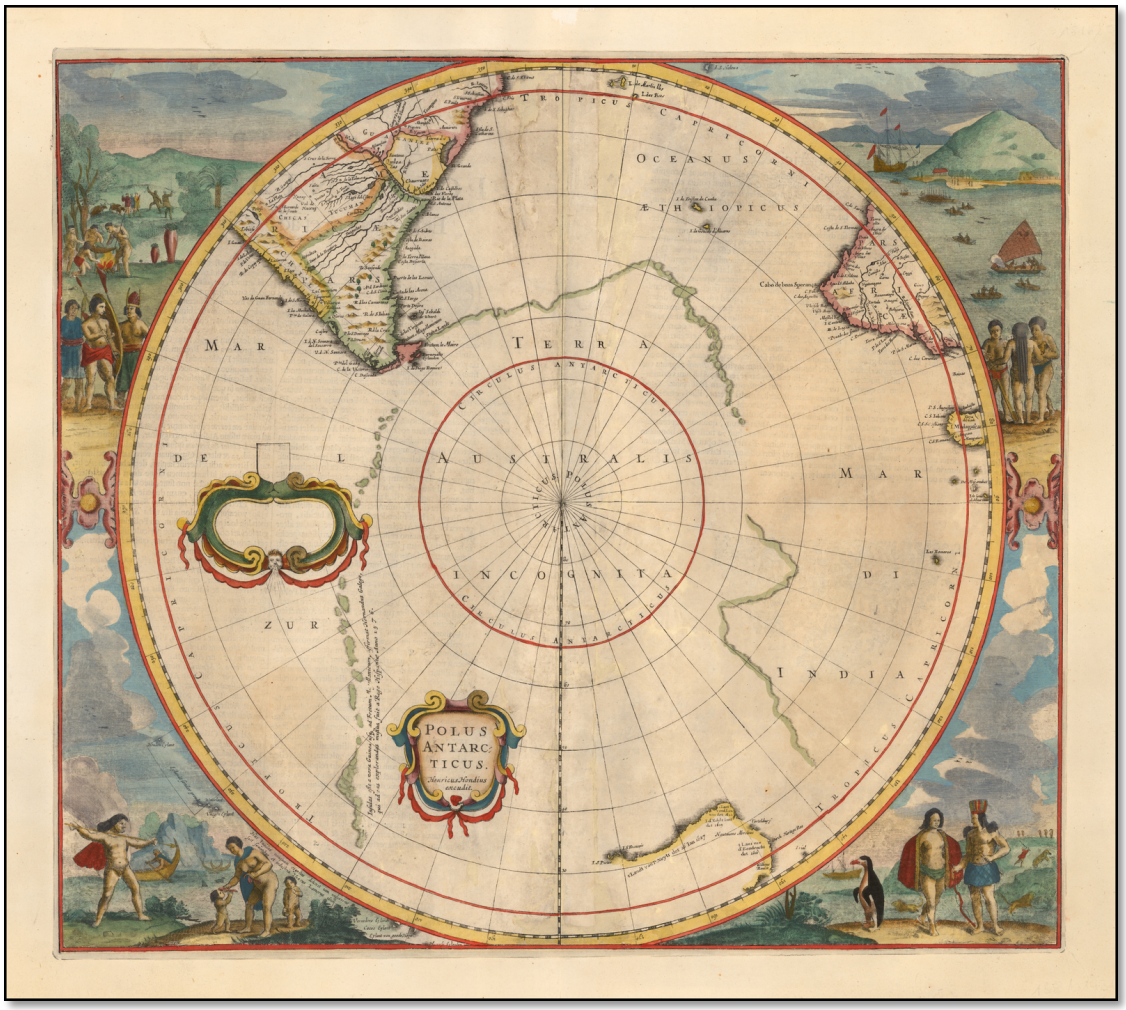
Detail: showing Viraginia [land of the Vragos]

Detail: showing Pamphagonia [land of the gluttons]

Joseph Hall, an English bishop and satirist, wrote Mundus after as a satire on the foflies of contemporary London and Europe, criticizing the Cathofic church and its customs, His narrator, Mercurius Britannicus, discovers the southern continent divided into the human vices, but the known mapped world is clearly ofHall 1 importance to the satire.

Detail: showing Lareina between the rivers of Momnia and Ruuius.
Also includes the Pacific Ocean and the Strait of Magellan.

An example of Pedro Teixeira's suppressed map of the Straits of Magellan, published in Garcia de Nodal's Relación del viaje hecho por los capitanes Bartolomé García de Nodal y Gonzalo de Nodal, hermanos, naturales de Pontevedra, para el descubrimiento del nuevo estrecho, published in Madrid in 1621. The map shows southern Patagonia and the Straits of Magellan separating the continent from the island of Tierra del Fuego. The real innovation of the map, however, is the small Strait of San Vicente to the east, which cuts between Tierra del Fuego and a small island that extends into the right hand border. This strait, discovered by the Dutch in 1616 and more commonly known as the Strait of Le Maire, proved that Tierra del Fuego was an island, not a part of the vast southern continent. More importantly, the strait provided an alternative outlet to the lucrative China trade and made the Spanish ports of western South America potential targets for rival empires.



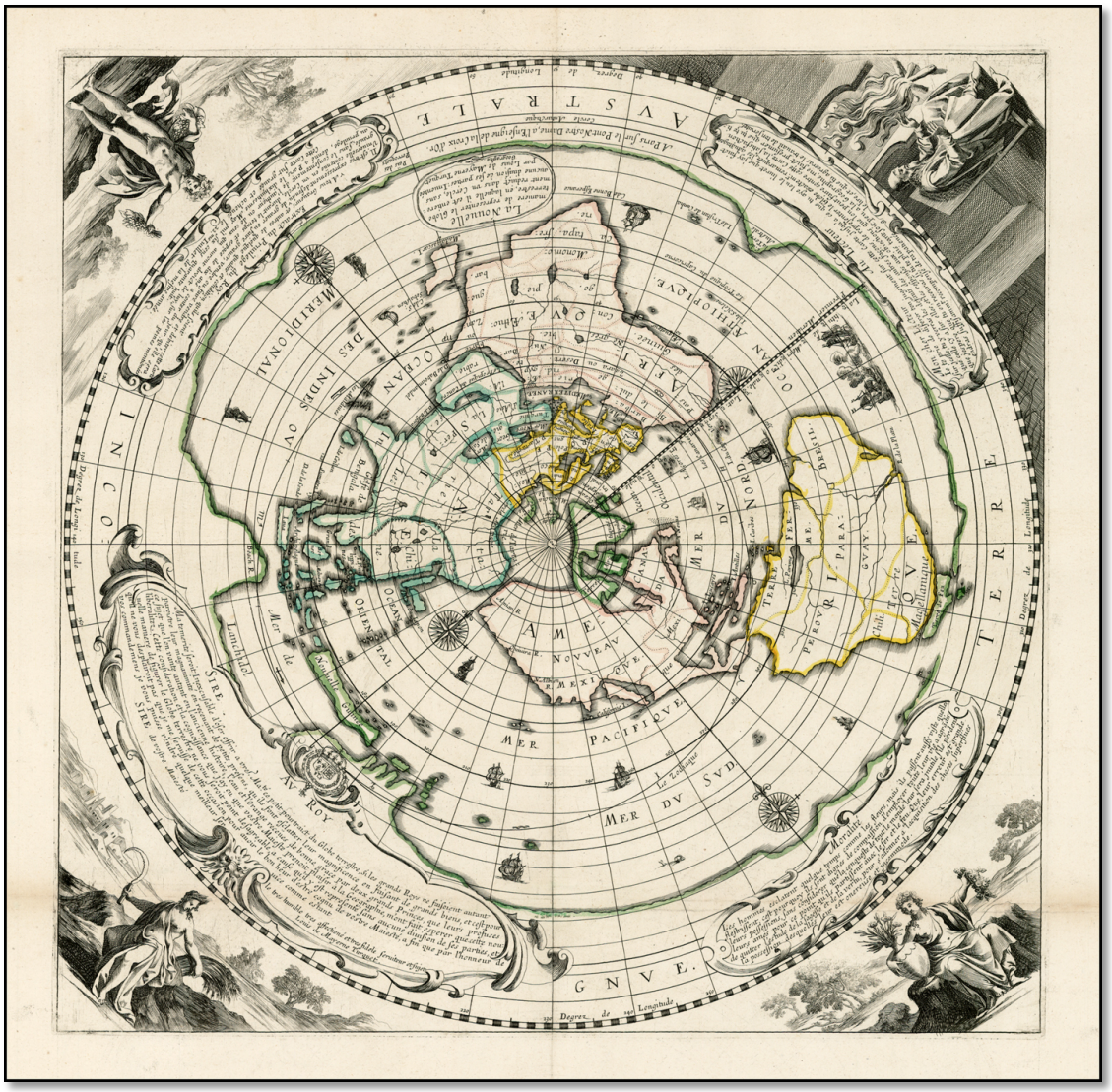
Polus Antarcticus. Henricus Hondius excudit, 1637
Hondius' decorative map of the South Polar region, predating the first appearance of New Zealand and Van Dieman's Land. The supposed coastline of the unknown southern continent continues to appear. Detail in Australia showing t' Lant van P. Nuyts discovered in January 1627, Edel's Lant discovered in 1619, Eendrachts discoveries in 1616, as well as notes mentioning Williams Renier and Dirck Hertogs Ree and several other place names and early contacts with Australia. Includes notes regarding the affirmation of the discovery of islands by Magellan and Hernando Galego.

As reported by L. C. Wroth, the voyage of Sir Francis Drake around the world in 1577-1580 did something to dissipate the idea of a *Terra Australis*, at least in so far as concerned the concept of a continent to the southward of South America. Drake was storm-driven into that part of the ocean commonly supposed to be occupied by the unknown land, and found himself south of Tierra del Fuego in an intricate archipelago with no evidence of continental land to the south of him. The unknown maker of the celebrated world map of Paris, 1587, found in Hakluyt's edition of Peter Martyr's *De Orbe Novo*, seems to have been affected by reports of Drake's experience, as was also the maker of the *Wright-Molyneux* world map, published in Hakluyt's

Principal Navigations of I598-1600. Both these skilled and thoughtful cartographers show to the south of the Strait of Magellan a group of islands rather than continental land. Their knowledge of the Drake association with this part of the world is indicated, in the one case, by the delineation of an island west of Tierra del Fuego with the legend *Ins Reginae Elisabetae 1579 ab Anglis,* in the other, by an island south of Tierra del Fuego called *Queens Iland*. These are one and the same island. Drake sheltered at this island from the great storm that drove him southward, and upon the basis of the narrative of his voyage it was located upon many maps of the ensuing two centuries. Eventually, however, it disappeared from the maps because no one in later years succeeded in identifying or relocating it. A recent study of the subject suggests that it once occupied the position designated on today's charts as *Burnham Bank*. The only trace of the mythical continent upon the *Wright-Molyneux* map is the faint indication of the point of land south of Java which for a long time on maps of the 16th and 17th centuries was called the province of *Beach*, as mentioned, an error derived from a misreading of the Marco Polo narrative of the 13th century.

The question of the existence of a landmass south of Magellan's Strait was not cleared up by the Schouten-Le Maire expedition of 1616, in which for the first time the Pacific was entered from the Atlantic by the rounding of Cape Horn, nor was the question greatly clarified by the book and map of the Nodal brothers, sent out by the King of Spain in 1618 to examine the Le Maire strait and study the possibility of maintaining control over this new passage into the Pacific. The existence of the southern continent was so strongly fixed in the minds of men of the time that they held on to it even after Le Maire and Schouten had proved Tierra del Fuego to be an island. In its place as the promontory of the *Terra Australis* the geographers now set up the small island, *Staten Landt*, which formed the eastern shore of the new-found Le Maire Strait. Once around the Horn the Dutchmen sailed northwestward across the Pacific and explored the northern coast of New Guinea, incurious, it seems, about the continent that they supposed lay south of their strait. The Nodals passed around the Horn through Le Maire's strait, turned northward, and sailed back to Spain by way of the Strait of Magellan. They designated *Staten Landt* as *la tierra Incognita* and showed it on their rare map with an indefinite eastern extension. In his expedition against the west coast of South America in 1643, Hendrik Brouwer was driven out of Le Maire's strait and forced to round *Staten Landt* from east to west, proving clearly that it was a small island and not the tip of the austral continent. But belief in the existence of a southern continent was so ingrained in the seamen and geographers of this generation that it was affected hardly at all by the experiences of Drake and Brouwer and only confirmed by those of Le Maire and the Nodals.

In the circumpolar world map which Louis de Mayerne Turquet published in Paris in 1648 (shown below), New Guinea is shown as an island off the shore of *Terre Australe Incognue*, which, beginning at *Staten Landt*, encircles the world. A break in its coast just west of the Strait of Magellan indicates some degree of uncertainty on the part of Mayerne Turquet, implanted there probably by the experiences of Drake, Le Maire, and the Nodals. Tierra del Fuego is drawn in this interesting map as an island completely detached from the *Terra Australis*.



La Nouvelle maniere de representer le Globe terrestre . . .
inventée par Louis de Mayerene Turquete , 1648

In the circumpolar world map that Louis de Mayerne Turquet published in Paris in 1648, New Guinea is shown as an island off the shore of *Terre Australe Incognue*, which, beginning at *Staten Landt*, encircles the world. A break in its coast just west of the Strait of Magellan indicates some degree of uncertainty on the part of Mayerne Turquet, implanted there probably by the experiences of Drake, Le Maire, and the Nodals. Tierra del Fuego is drawn in this interesting map as an island completely detached from the *Terra Australis.*

The map was first published in Louis de Mayerne Turquet's *Discourse Sur la Carte Universelle...*, published in Paris in 1648 and again in 1661. In the book, Mayerne Turquet details numerous map projections, including projections by Gemma Frisius, Peter Kaerius, Abraham Ortelius and Guillaume Postel, among others. The map illustrates a projection that is his own invention, which Mayerne Turquet published as an attachment to *Discourse*. Of perhaps greatest cartographic note, it is the second edition of this map that first includes the name *Nouvelle Hollande* in the Southern

Continent, where only the name *Beach* appeared in the first edition. Other names added by Mayerne Turquette including *Pais d' A Van Diemen, Terre de Wits, Willem R.* and *Terre de Leuwin*, demonstrating that he was aware of the then current theory that Australia may have first been discovered by a Frenchman, Captain Binot Paulmyer de Gonneville, in 1504. This story had gained significant currency in the mid 17th century in France and influenced the cartography of French mapmakers for the next 100+ years.

Mayerne Turquet's map shows the entire world in one circle, with inevitable distortions to the areas at the extreme radii. The geographical outline is simplified, with the borders of various countries shown, but only a few place names. Around the map are panels of text and personifications of the seasons. As Eyries states in *Nouvelles Annales, II,* "La projection en est très bizarre." The map is truly bizarre.

The first cartographer to fashion a north polar azimuthal equidistant map of the entire world was Urbano Monte of Milan *(#420)*. Monte's map consisted of sixty-four sheets and was issued in 1603. Mayerne Turquet's work followed in 1648 and inspired others, including the highly influential work of Jean-Dominique Cassini, who produced a now lost world map on the floor of the Paris Observatory in the 1680s.

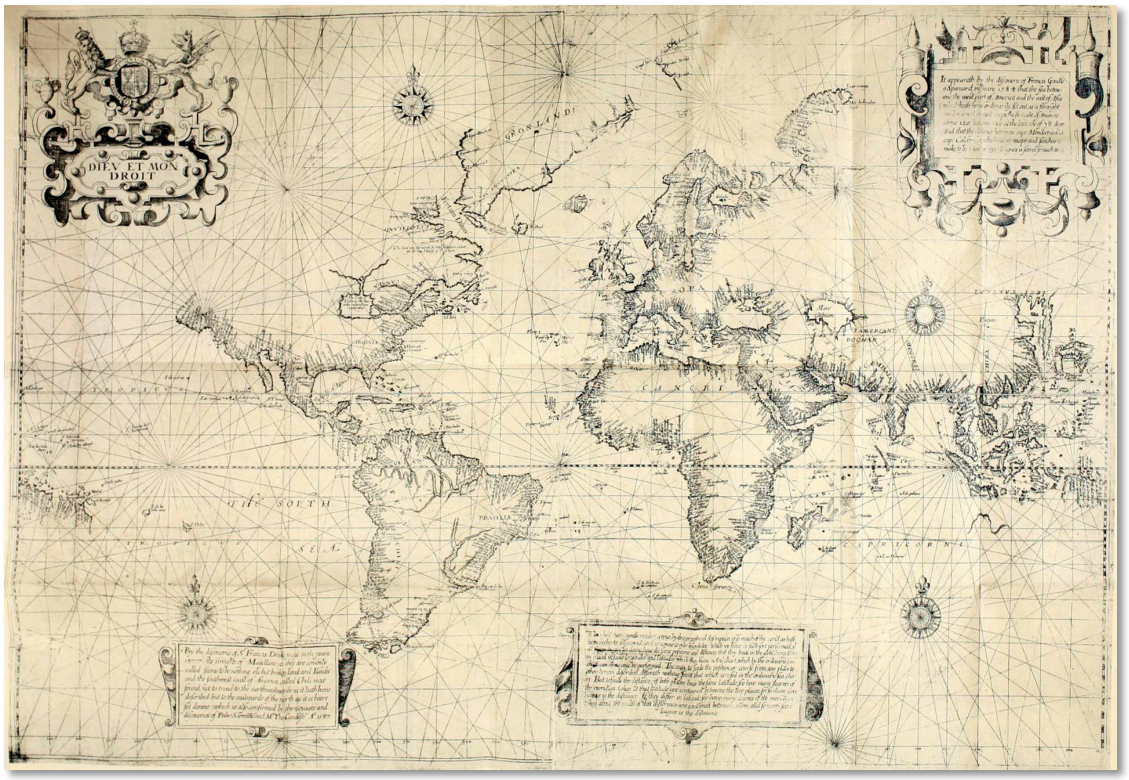
'Taboas geraes da toda a navegacão' (1630), a manuscript atlas by Portuguese cartographer João Teixeira Albernaz

In João Teixeira's atlas of 1630 the discoveries of the Dutch are combined with the fantastical writings on the southern continent of Teixeira's Spanish countryman, Manuel Godinho de Erédia. In a number of maps and manuscripts, Erédia details the supposed existence of a land south of Java, which he calls *Lucaantara* that …"should be the general name for the peninsula on which were situated the ports in the Kingdoms of *Beach* and *Maletur*". Thus Teixeira's southern continent includes two

notable inscriptions. The first reports the discovery by the Dutch of Eendracht's Land. The other, at the northern-most promontory to Teixeira's southern continent, designates that region (in translation) "*Nuca Antara, discovered by Manoel Godinho de Erédia in the year 1601*." Teixeira seems to have no qualms about conflating the Dutch discoveries with established belief in a southern continent, though the bold cartography of his atlas may belie the very same doubts entertained by many of his counterparts who were uncertain about the relationship between the emerging geographies of Australia with the long-standing conceptions of *Terra Australis.*

Cartographie des Amériques in Pierre Martyr d'Anghiera De orbe novo 1587

Stallard concludes that what changed was that for cartographers in the late 16th century and beyond, imagining the southern hemisphere without a southern continent was quickly fading as an option. Not only had the cosmography of *Terra Australis* been matched to the empirical data of voyages of discovery, thus entrenching the concept of a southern continent as something altogether more potent and real than an imaginary land, but cartographers had helped make *Terra Australis* one of the most visually striking geographies of the world map. That process finally reached its apex with the cosmographic and geographic reckonings of Gerhard Mercator, consummated in his peerless world map of 1569.



Wright-Molyneux world map, 1600

For two hundred years, the illusion of the *Terra Australis Incognita* nourished the fantasies not only of geographers, but also of politicians, explorers, conquistadors, as well as authors of extraordinary and utopian voyages. The French geographer La Popelinière (1582), for example, urged the French monarchs to try and match the huge colonial expansion of the Spaniards by launching expeditions that would enable them to take possession of and colonize this "*France Australe*", deemed to be as large as the Old World and the New World combined.

One may notice that the representation of Antarctica on the maps of the 16th and 17th centuries are often very similar to one another, especially for a landmass that, at this time, was a total "invention" of the cartographer, This is because plagiarism was quite common among cartographers of this period. This can also be seen in the other "inventions of that time such as California as an island and the mythical island of *Frislandia*.

Known more for its coverage of the Arctic and Far East than for its depiction of the far southern landmasses, Dutch-Flemish cartographer Petrus Plancius' *Orbis Terrarum* represents *Terra Australis* in much the same way Ortelius's *Theatrum* did 20 years earlier.

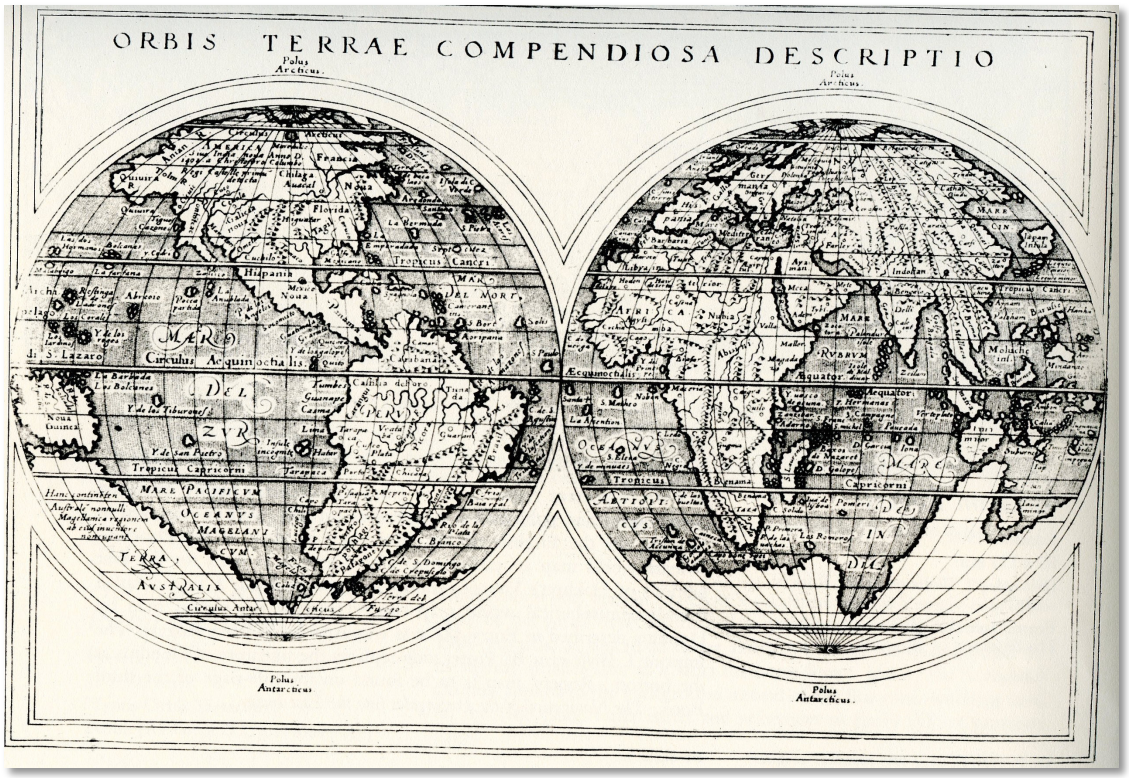
Originally completed in 1590, Plancius' world map depicts Antarctica as nearly reaching the southern end of South America, like the Ortelius' *Theatrum*. It also shows the continent extending north almost to New Guinea and Java, again like Ortelius' map, reaching far into the Indian Ocean and terminating relatively close to the southern shores of Africa.

Les Trois Mondes. La Popelinière. Paris: 1582.

Mapamundi Realizado Por El Cartografo Real De Felipe Ii En 1588, by Christian Sgrooten showing the Antarctic region as a large amorphous landmass and a large number of unnamed islands in the southern Indian/Pacific Oceans (#422)

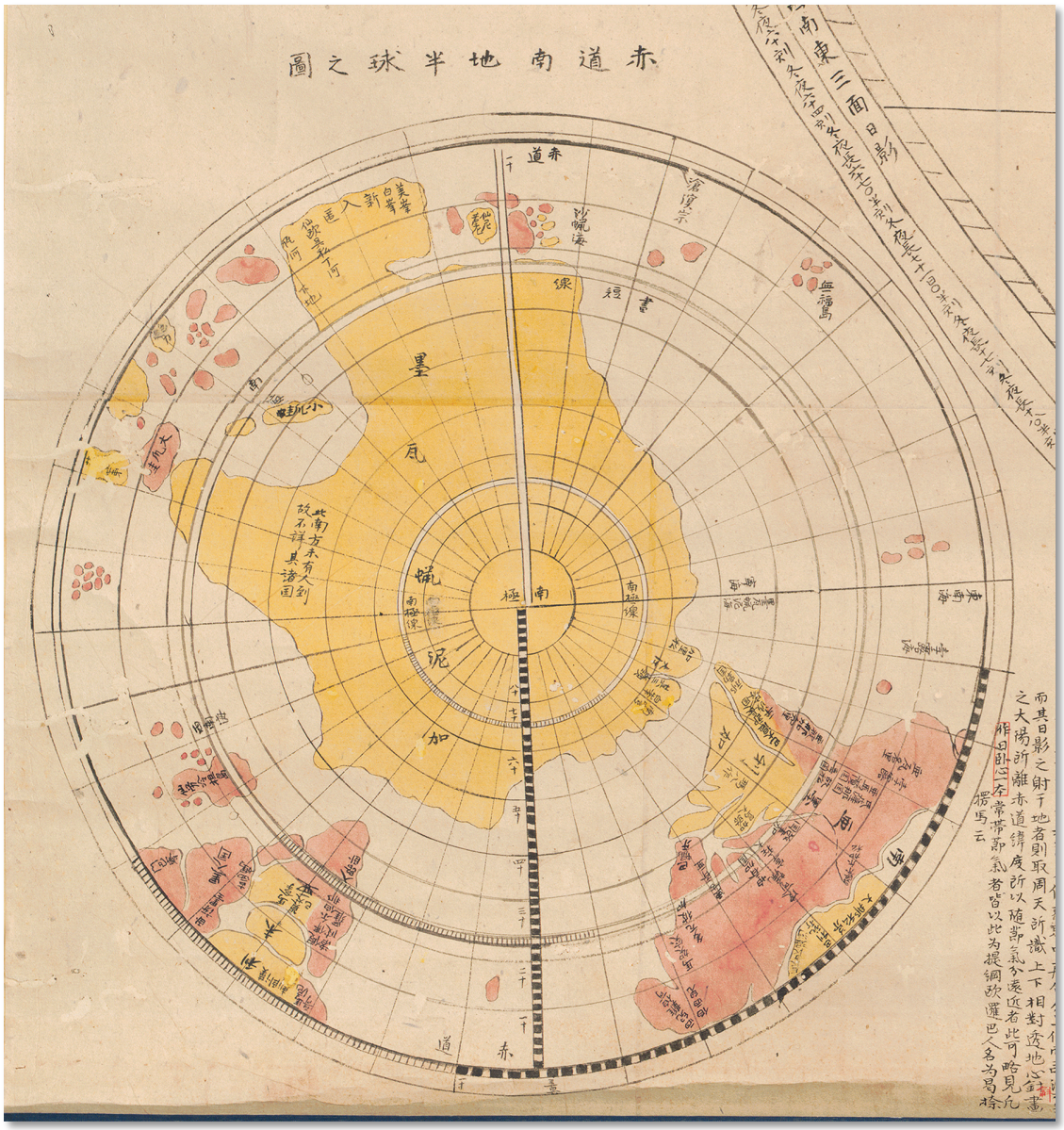
1596 world map by Petrus Plancius-Jan Baptist Vrients depicting the four-island North Pole and Magalla Nica [Antarctica] reach to nearly the equator

This hypothetical continent, named *Terra Australis Incognita* on many maps, continued to change shape and size—often having distinct shorelines and often no distinct shorelines—as European exploration of the Pacific Ocean advanced through the 17th and 18th centuries. The systematic search by Captain James Cook on his second voyage in the 1770's finally proved that such land, by then greatly diminished, would only be found in the cold, uninhabitable, polar regions. That set the stage for the 19th and 20th century European pursuit of Antarctica and the South Pole.

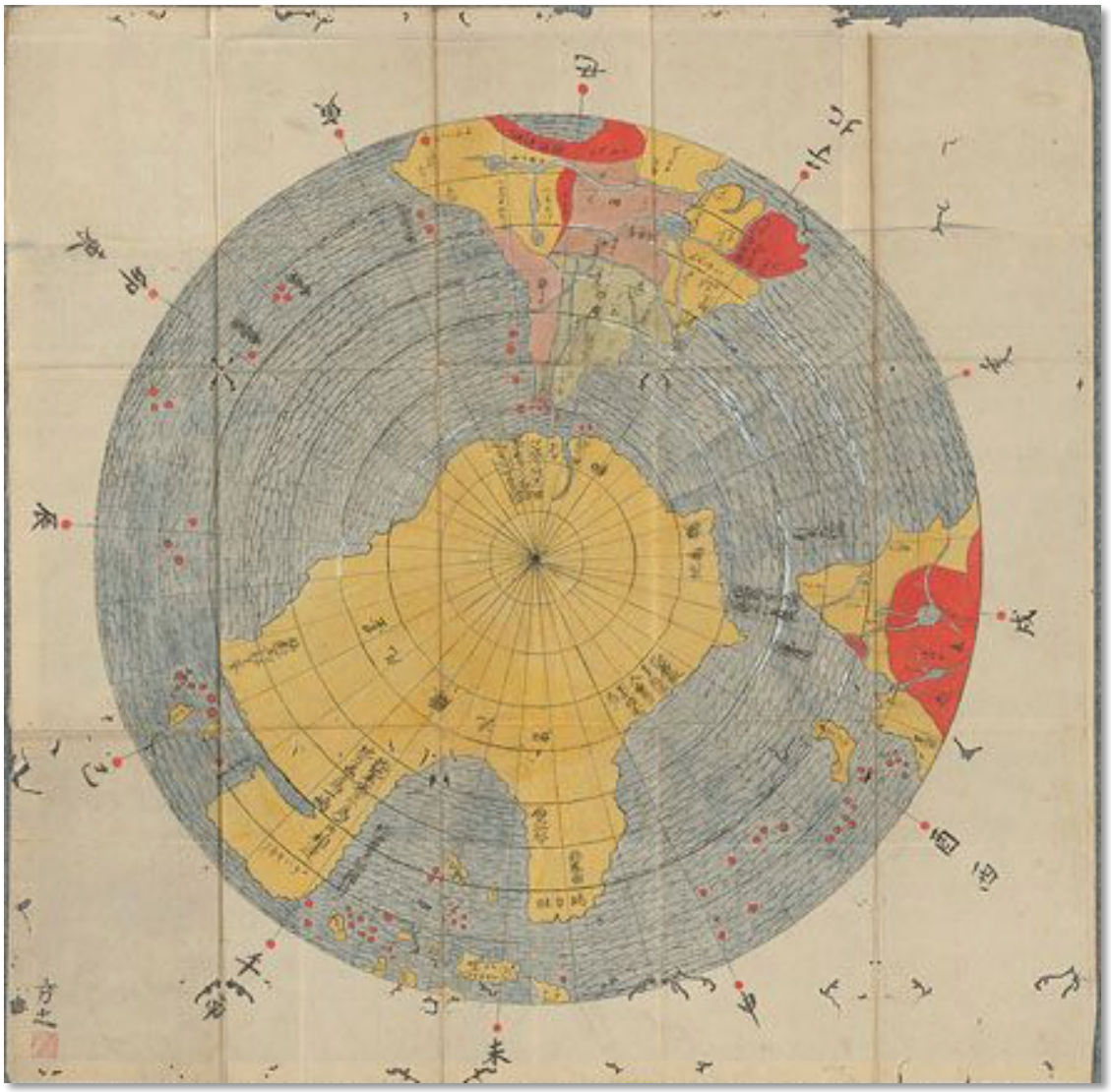


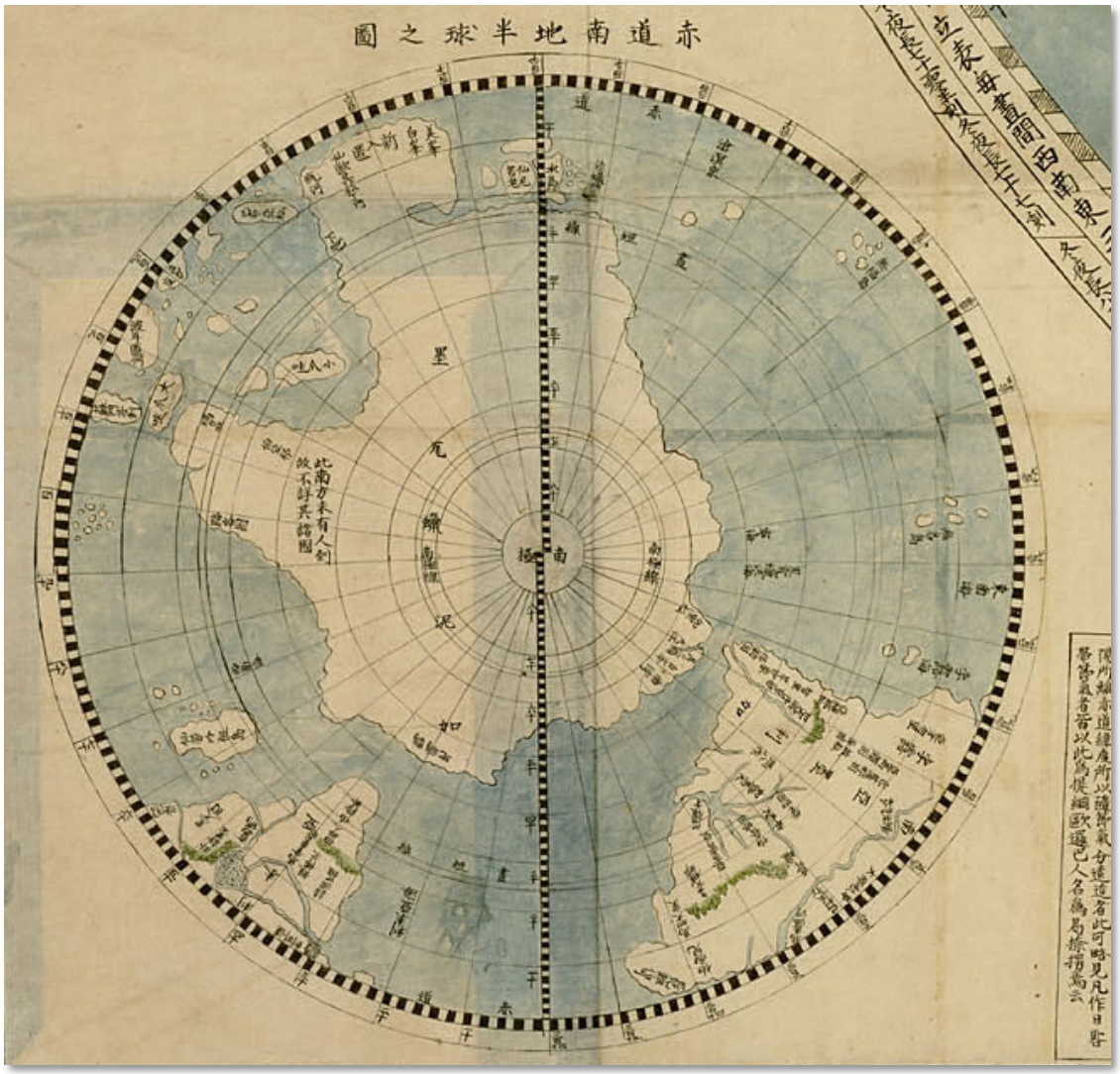
1598 double hemisphere map by Giuseppe Rosaccio displaying an unusual southern continent

At the beginning of this history of the southern continent of Antarctica the distinctive geography of *Terra Australis* was, literally, ages from being realized; what was found in its ancient and medieval precursors was a nebulous, mutable concept of a southern continent in the form of the *Antipodes*. It was only once the *Antipodes* were manifested in the plausible guise of *Terra Australis* that the southern continent became a core belief within the canon of cosmography. Maps like Jodocus Hondius senior's striking world map of 1602 in which the southern continent is depicted in arch-Mercatorian style ensured the diffusion of knowledge of this geographical entity. Indeed, the southern continent was no mere idea, broadly understood; *Terra Australis* was considered a geographical entity in its own right, attracting generations of advocates, some of whom eventually set out to discover that land. It was, of course, not there, a fact that cartographers and scholars reconciled with a mix of pragmatism, obscurantism, and sheer confusion.

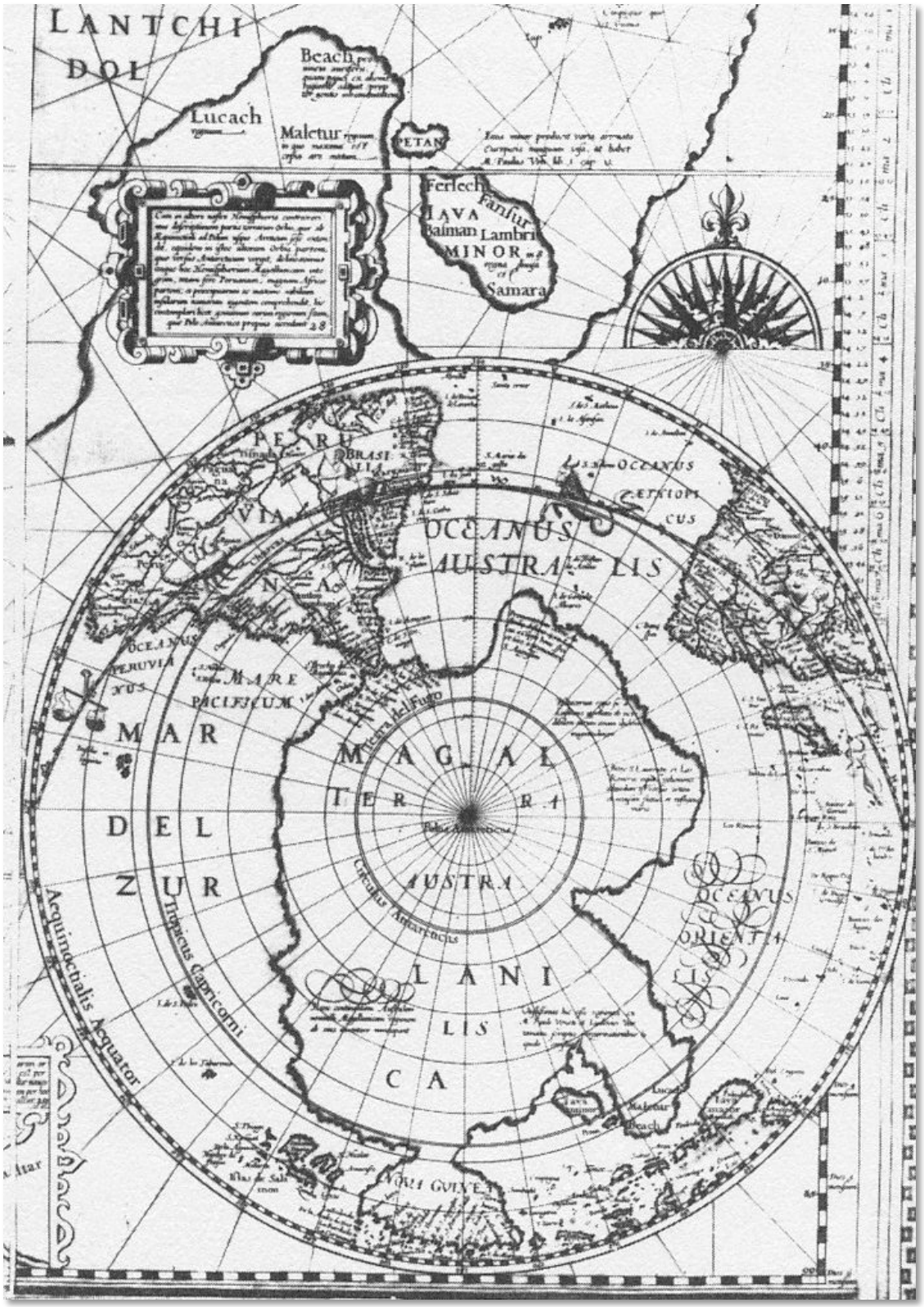


Detail of southern polar projection, lower left corner, Japanese map of the world, late 18th or early 19th century, MacLean Collection, MC17363





South Pole on the world map, Kunyu Wanguo Quantu 坤輿萬國全圖
by Matteo Ricci (#441)



Inset of Antarctica on the 1604 world map by Josua van den Ende

Untitled copperplate map, from Joseph Hall's Mundus alter et idem siue Terra Australis ante hac semper incognita longis itineribus peregrini academici nuperrime lustrata 1607?

The *Terra Australis* appears in 17th century satire in the form of Bishop John Hall's *Mundus alter*, published in Latin at Frankfurt in 1605 and in English as *The Discovery of a New World*, London, 1609. The Bishop's new world was the *Terra Australis Incognita* of contemporary geography. Of this so-called "unknowne Southerne Continent," he asks pertinently, "If they know it for a Continent, and for a Southerne Continent, why then doe they call it unknowne?" Thereafter he proceeds to a minute description of the many divisions of the land; he denominates the whole area as "the South Indies bordering upon Terra del fuego," and divides it into three great states: *Tenter-belly, SheeLandt*, and *Fooliana*, and each of these in turn into provinces and cantons of a similarly burlesque nomenclature. The Bishop's satire appeals to us today chiefly as a curiosity, but the maps which accompany the Latin edition of 1605 are of genuine imaginative quality and truly amusing, embodying as they do the geography of the normal maps of the time, and, south of the older and correctly delineated continents, this new world of fantastically named countries and districts, rivers, lakes, and mountains *(see map below).*

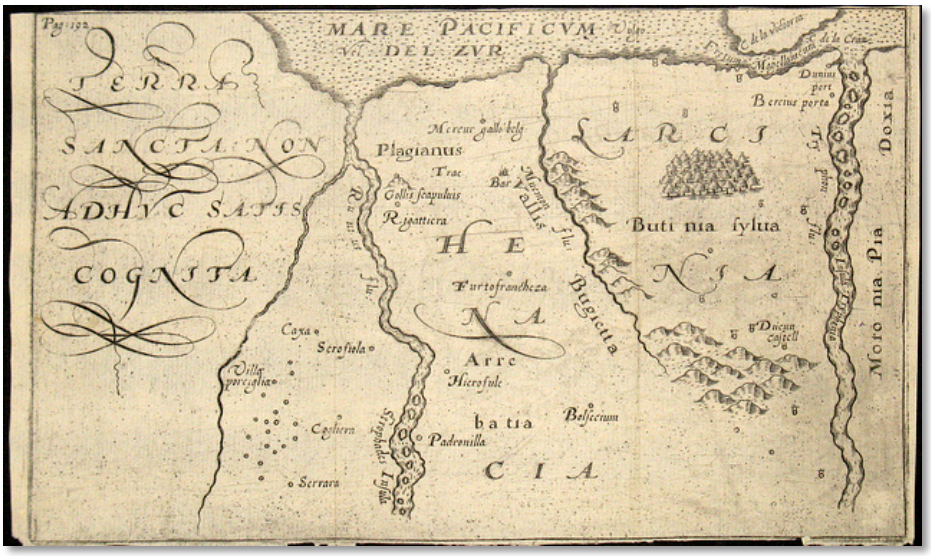
Bishop Joseph Hall of Norwich, England, mocked the idea of the southern continent in his book about the discovery of a new world. His satire included this world map, in which he divided *Terra Australis* into areas called *Tenter-belly, Shee-*

landt (Womandecoia), *Fooliana*, and *Theevingen*, with provinces like *Eat-allia, Drink-allia*, *Double-sex, Asse-sex, Cocks-combaya, Shrewes-bourg, Pamphagonia, Ivronia, Moronia, Viraginia, Lavernia*, etc.

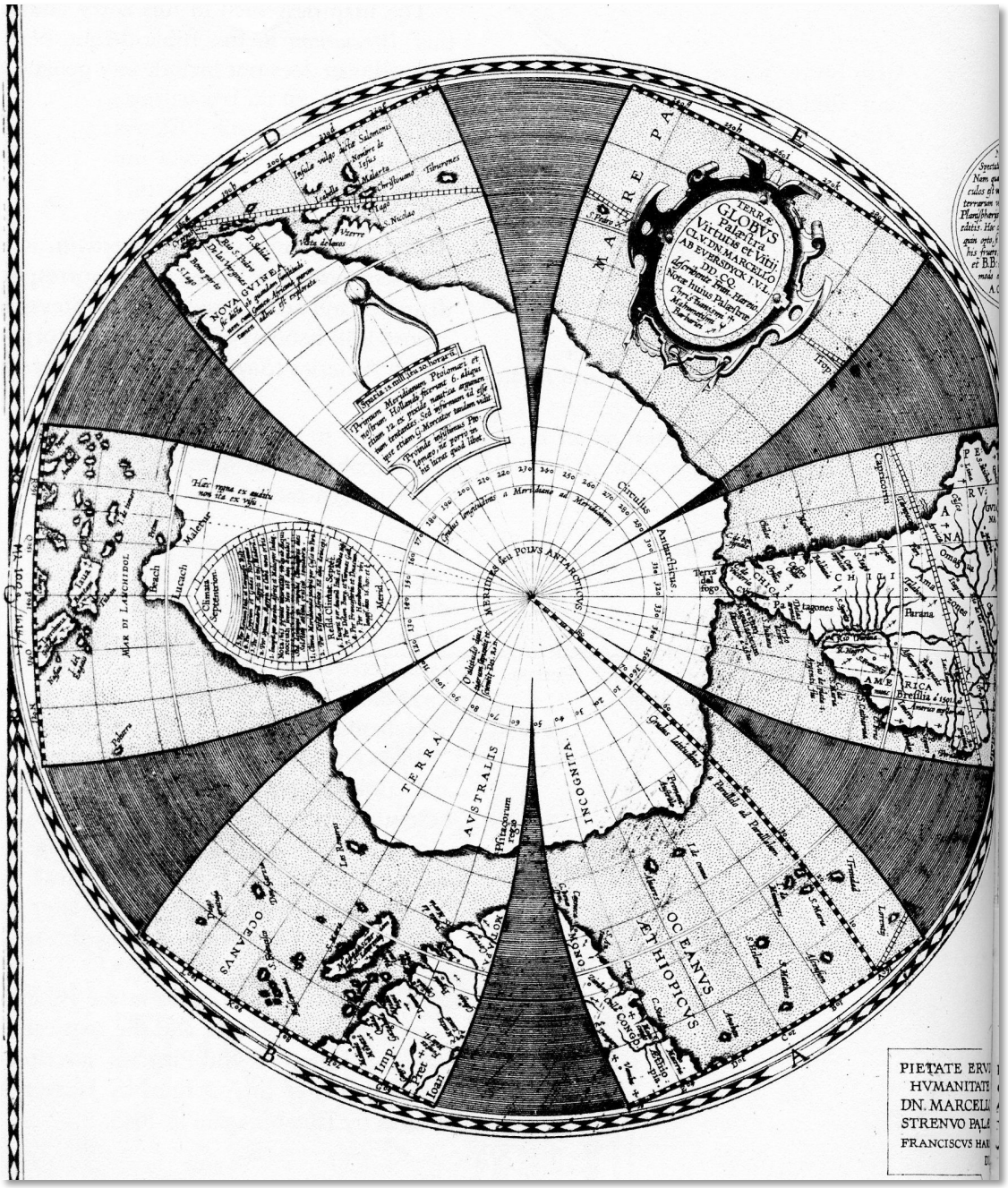
The world map, and, in particular, the southern continent, offered the opportunity not only for a history of the world image but also for its satirical refashioning. In Joseph Hall's *Mundus Alter et Idem* of 1605 it is precisely the absence of exploration that encourages mock-cartographic representation of *Terra Australis*. Unlike Hondius and Blaeu, Hall was not a professional cartographer, and his narrative, the unreliable account of the travels of one Mercurius Britannicus to the great southern land, is accompanied by a series of maps whose target is precisely the intellectual opulence of the kind that characterizes maps such as those produced by the two Dutchmen. On Hall's world map the southern continent is exaggeratedly large, and divided into the regions encountered by the narrator on his travels to the hitherto unknown 'other world. The map displays on actual toponyms (New Guinea, Virginia, Patagonia) and cartographic convention, including amongst its regions '*Terra Sancta (Ignota etiam adhuc)*, [Holy Land even yet unknown], *Aphrodysia Nova Gynia vel Viraginia*, and *Pamphagonia*. A series of regional maps accompany the text, so that the reader is able to follow Mercurius' adventures in food and drink-sodden *Crapulia*, female-run *Viraginia*, overpopulated *Moronia*, and dangerous *Lavernia* (a region of rogues and thieves), and to trace his progress through such cities as *Marzapane, Mortadella,* the fetid *Fourmagium, Gynaecopolis* (capital city of *Viraginia*), *Orgilia, Pazzivilla*, and *Larcinia*. The locations of these places are given with reference not only to parts of the known world, but also to parts of *Terra Australis Incognita* that had become familiar to a cartographically-aware audience.

'Crapulia' from Joseph Hall, Mundus alter et Idem (1605). London, BL, 684.d.5.

Hall printed maps of the regions of Terra Australis to augment the world map which appeared in Mundus alter et idem. His mixture of real and fantastic geography sees here the region of Crapulia, divided into two provinces, Yvronia (= intoxicated) and Pamphagonia ('the most voracious gluttons'), with the latter sub-divided into the 'Golosinius Tract' and the 'Lecanican Plain'. Crapulia is found to the west of Locania and Viraginia, to the north of Moronia Felix, to the east of the Tryphonian Swamp - and to the south of the Cape of Good Hope, and south-east of America. Amongst other features the map represents the fertile fields of Offulia and Lardana, the city of Mortadella, the fetid village of Fourmagium, and the metropolis of Artocreopolis.

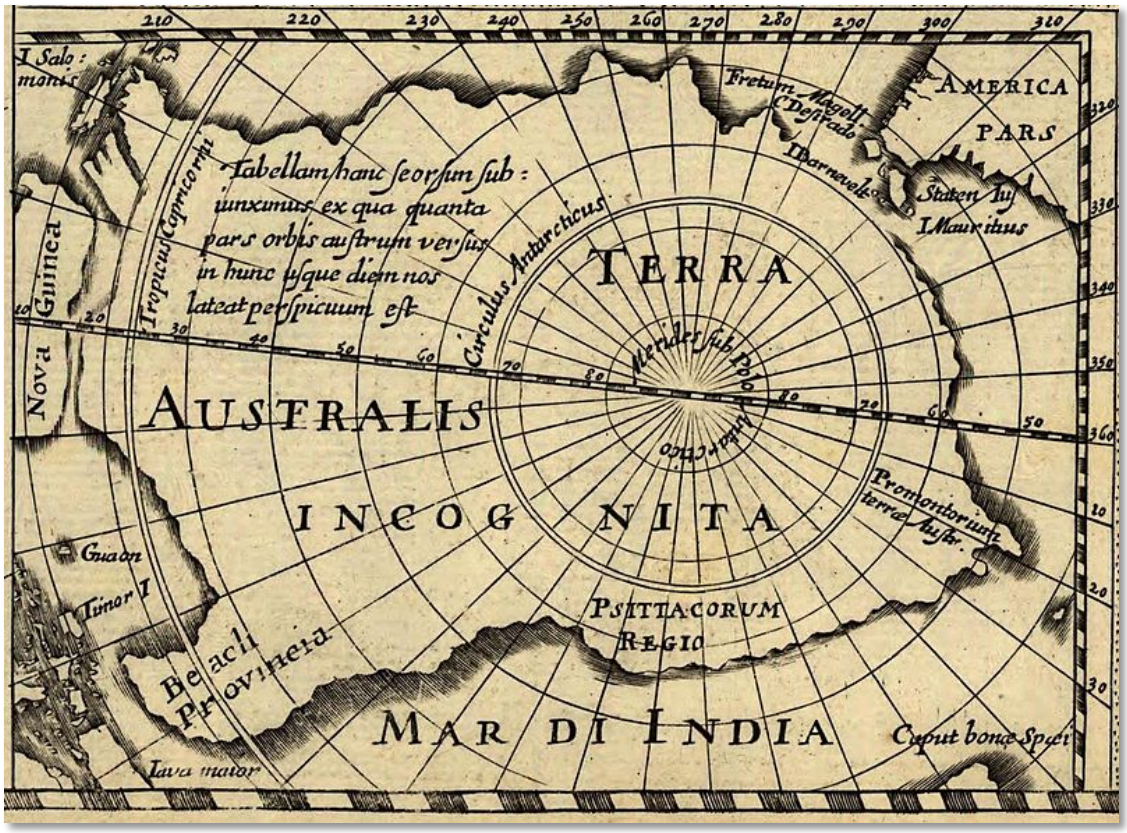


The *Terra Australis* that appears in this 17th century satire in the form of Bishop Hall's *Mundus alter,* was published in Latin at Frankfurt in 1605 and in English as *The Discovery of a New World*, London, 1609. The Bishop's new world was the *Terra Australis Incognita* of contemporary geography. Of this so-called "unknowne Southerne Continent," he asks pertinently, "If they know it for a Continent, and for a Southerne Continent, why then doe they call it unknowne?" Thereafter he proceeds to a minute description of the many divisions of the land; he denominates the whole area as "the South Indies bordering upon Terra del fuego, and divides it into three great states, *Tenter-belly, SheeLandt,* and *Fooliana*, and each of these in turn into provinces and cantons of a similarly burlesque nomenclature. The Bishop's satire appeals to us today chiefly as a curiosity, but the maps which accompany the Latin edition of 1605 are of genuine imaginative quality, embodying as they do the geography of the normal maps of the time, and, south of the older and correctly delineated continents, this new world of fantastically named countries and districts, rivers, lakes, and mountains.

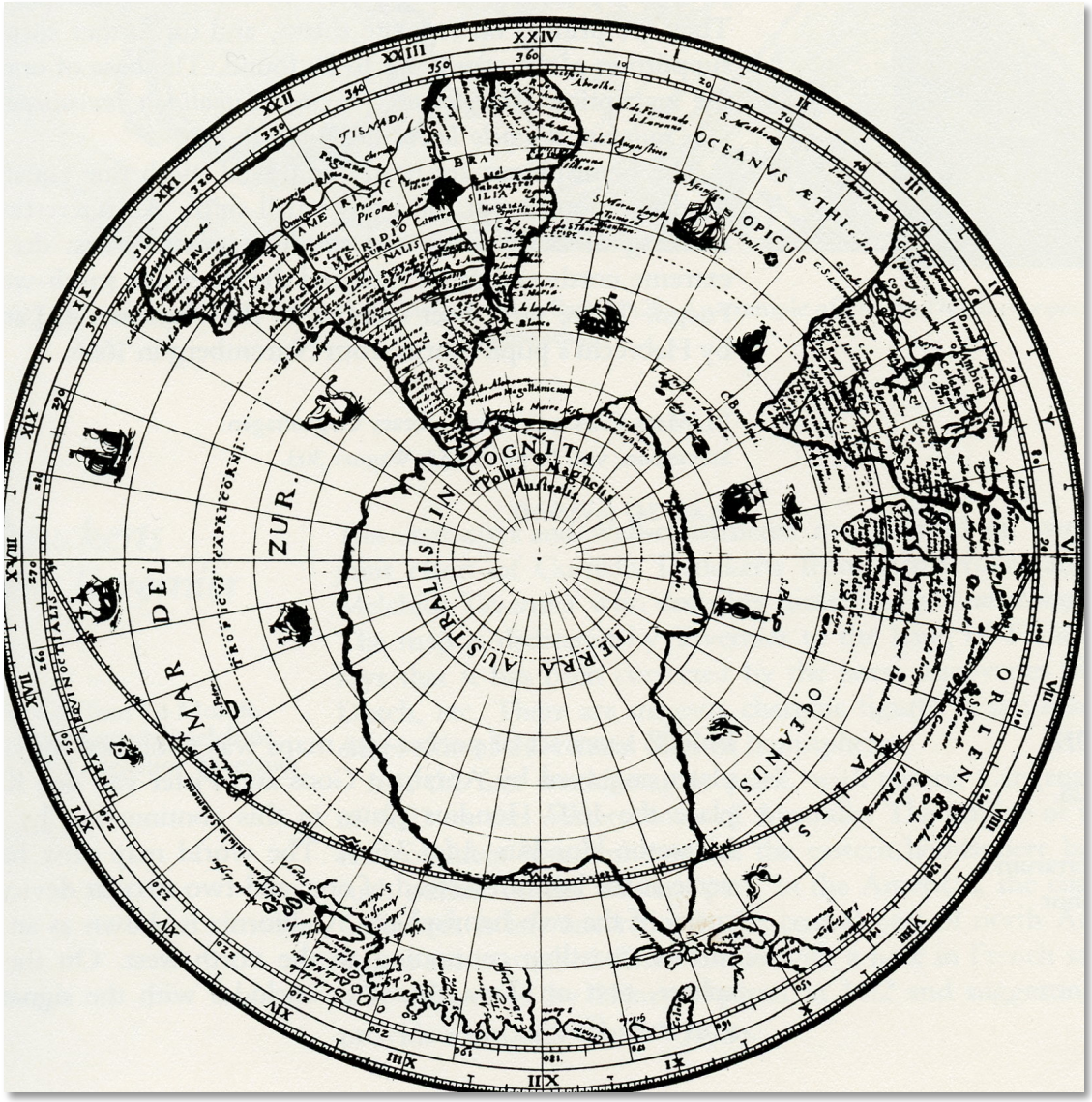


Antarctica on a double hemisphere map by Franciscus Verhaer, 1614

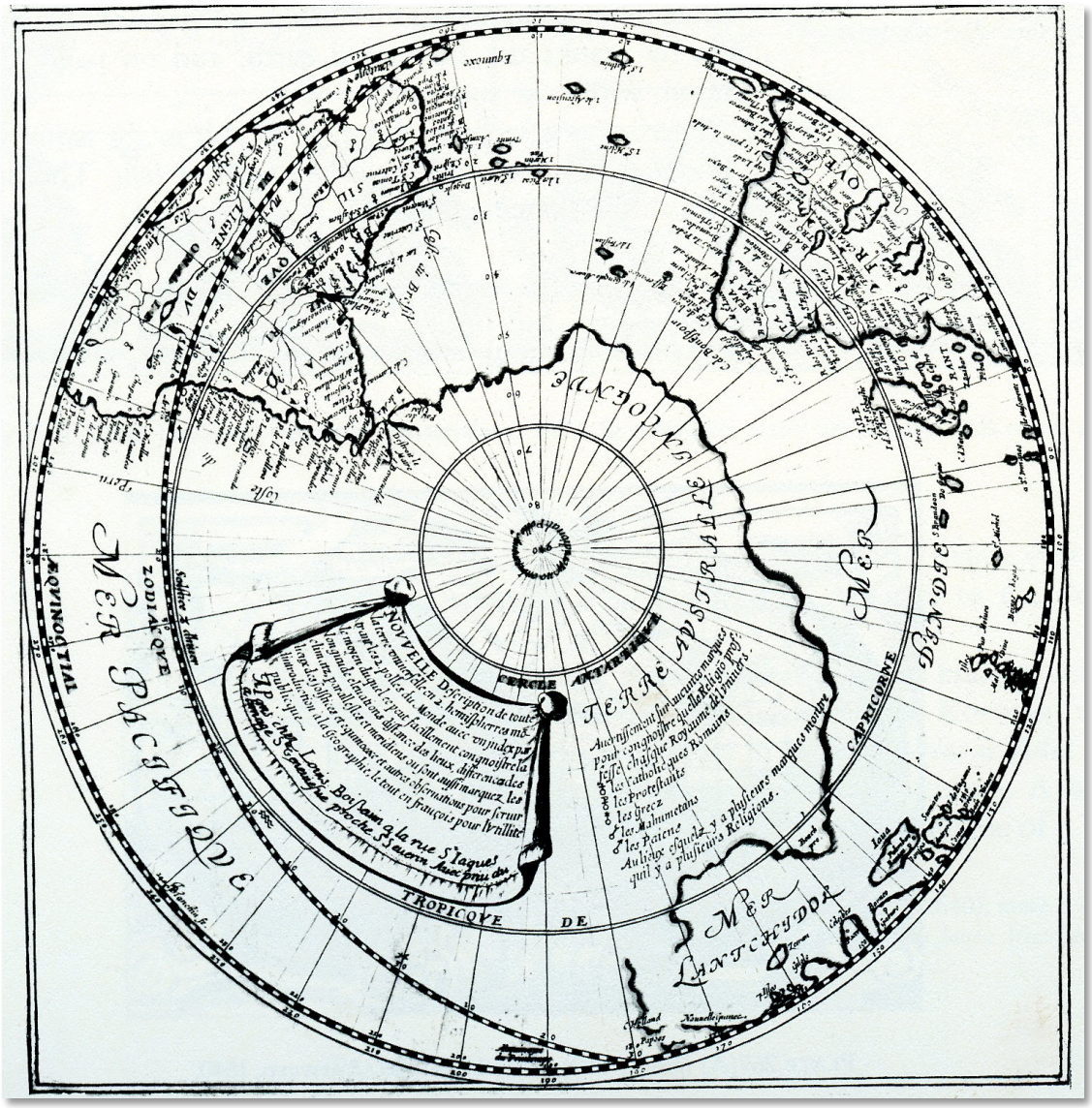
"Descriptio terræ subaustralis" from Petrus Bertius' P. Bertii tabularum geographicarum contractarum (Amsterdam, 1616). [Historic Maps Collection]



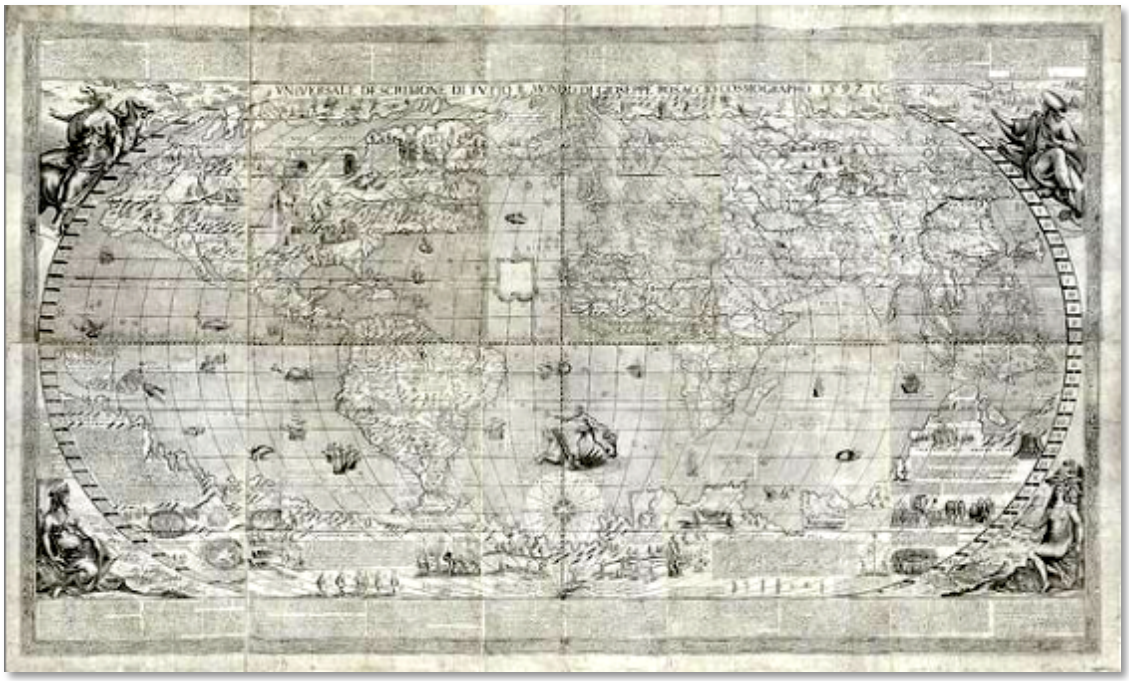
Terra Australis Incognita, Hondius, 1618, pars tabulam AMERICA noviter delineata, auct. Jodoco Hondio, 1618; H. Picard fecit [1640].



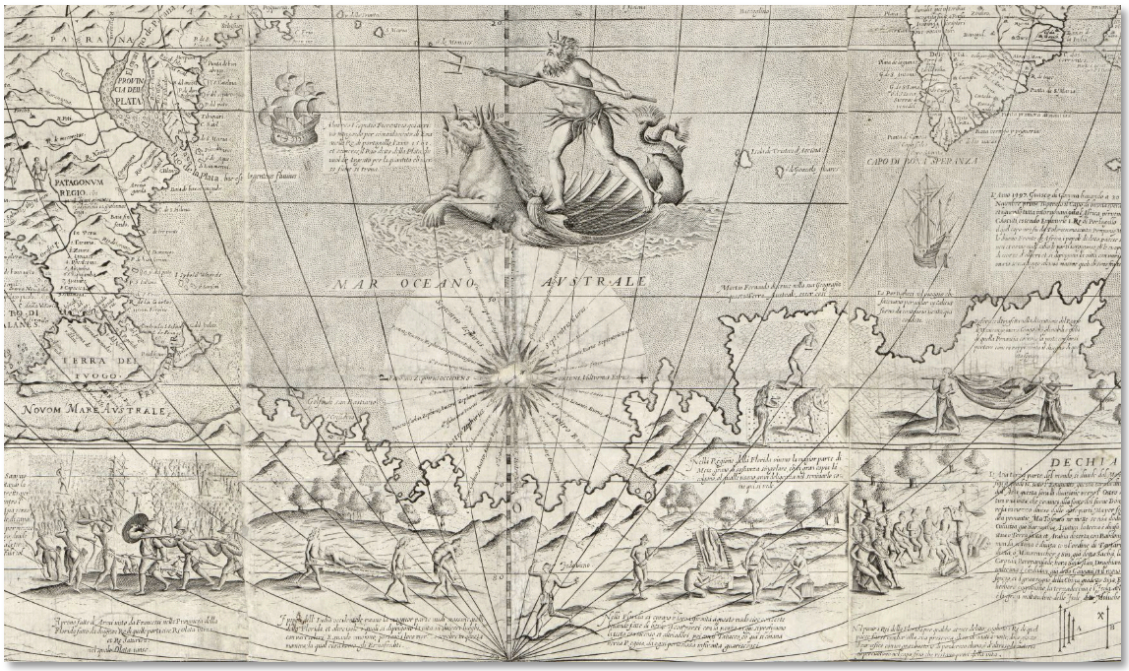
One of two hemispheric maps by Isaac Habrecht, 1628 with the magnetic pole marked



Terra Australle Incognita [Antarctica] on a double hemispheric map by Jean Boisseau, 1640



Universale Descrittione di tutto il Mondo di Gioseppe Rosaceio Cosmographo...
By Giuseppe Rosaccio, 1642 (#475)



Detail: A very populated Terra Australis on the Rosaccio map.
This was not uncommon on world maps of this period to populate the southern continent with lots of animals and occasionally people.

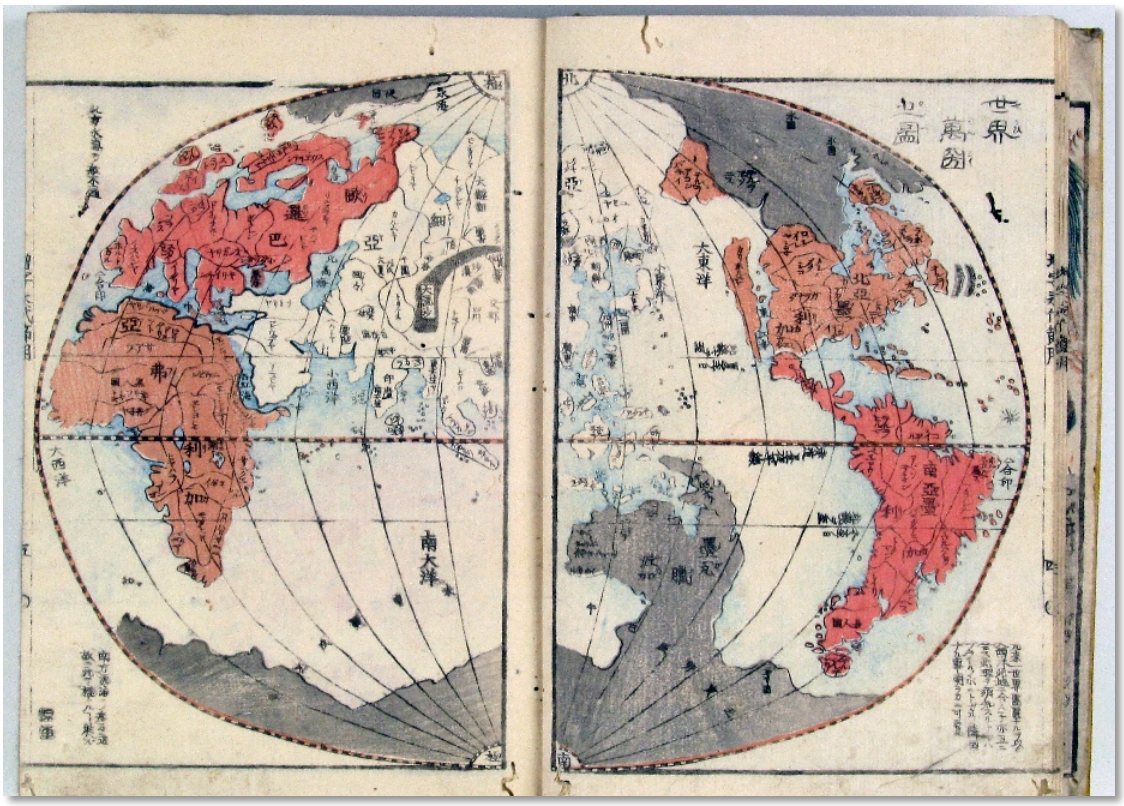
But as the 17th century drew to a close, and as the discipline of cartography became more and more geared toward visual austerity as well as empirical verifiability, *Terra Australis* became a much rarer sight on maps.

It was, ironically, French cartographers, pioneers and leaders in the new style of "plain representation" or "scientific cartography", who remained most likely to depict conjectural geographies alongside empirical constructs, but for the most part map-makers avoided the embellishment intrinsic to conjectural geography, in line with the new milieu. By the close of the 17th century, *Terra Australis* was no longer an essential artifact of cartographies. What is more, *Terra Australis* all but disappears from the itineraries of explorers, a rare breed in their own right in the latter half of the 17th century. After Tasman's voyages, the Dutch abandoned their quest to further discover the known and unknown *South-lands*, and there was no other company or nation willing to take up their mantle. So while to the retrospective observer it is obvious that the riddle of the *Antipodes* was on the verge of being answered—requiring perhaps one or two voyages of discovery to probe the eastern coast of Australia, fully reconnoiter the extent of New Zealand, and traverse the 50th parallel—in the wake of Tasman's voyages exploration languished in a torpor lasting over 100 years.

Terra Australis always had advocates who continued to see value in the prospect of discovery, and cosmography seemed fuller and more comprehensible with the southern continent occupying the south. The real problem was not interest or relevance, but rather the pragmatics of exploration.

The simple reality of the "Age of Discovery" was that exploration, though undoubtedly the product of curious minds, was inexorably constrained by the fiscal obligations of commercialism; the promise of immediate or future gain was a principal rationalization for any voyage, thus an exploratory commission depended on expectations of profit. Van Diemen had gotten away with his schedule of expeditions on the auspices of profit-seeking; be it a passage to Chile, or southern lands rich with minerals and marketable goods, and people with whom to trade. But for all the hype and rumor, no voyage in search of *Terra Australis*, nor any accidental encounter with the coasts of *New Holland* {Australia], had yielded anything of commercial or even strategic value—while at the same time they had cost dearly in both lives and money. So it was bitter experience that proved there was no profit to be had in the short term, which is why the Dutch commercial directors, like the Dutch East India Company (VOC), resolved to forbid any further exploratory expeditions in the wake of Tasman's reports.

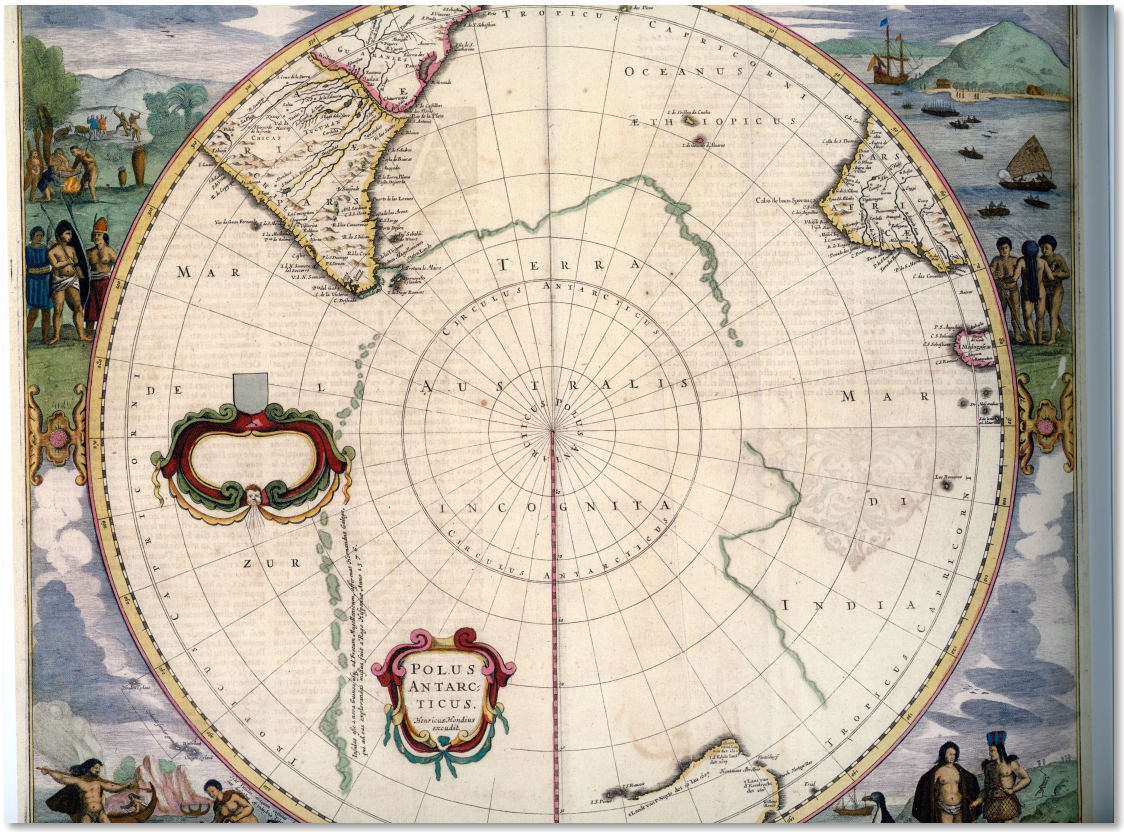
Nevertheless, in the late 17th century the discourse on *Terra Australis* was considerably different to the discourse of the past two centuries. The urgency, the excitement and the passion that had characterized the books, petitions and maps of earlier advocates for a southern continent had been replaced, for the most part, by apathy. *Terra Australis* was no longer lusted after by explorers; it disappeared from many maps, and on those where it did appear it was no longer the arresting central geography of Mercator and his ilk, but more a subsidiary geography—fragmented, faint, often only implied: present with a question mark attached. And in books concerned with history, geography or exploration it was often given short shrift, some- times dispensed with in a list of geographies, sometimes completely absent. To be sure, *Terra Australis* did not disappear from the discussions of cosmographers, geographers, explorers and idle fanciers; but it became context rather than focus: it was cosmographical and historical background, it was common knowledge, but it was not the prominent geography of the early 17th century.



Japanese world map, 1635

Kon-yo Bankoku Zenzu, a copy of Matteo Ricci's world map, early 17th century

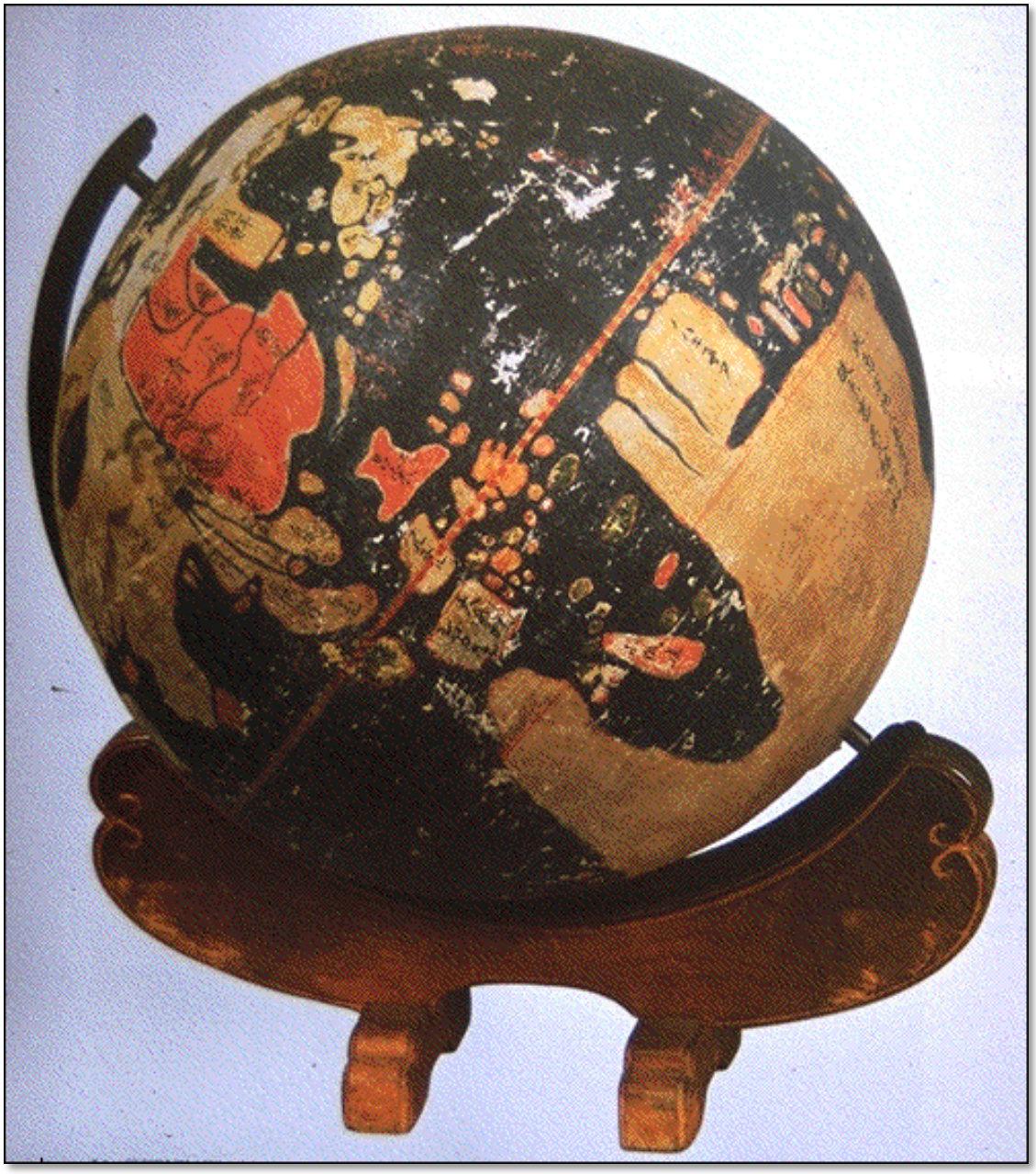
South Pole from a Japanese map of the world, 17th century, Namban Bunka-kan



PolusAntarcticus, Henricus Hondius, 1641

This map isolated the Australian discoveries from the Asian landmass. It refocused the Dutch exploration of Australia and New Zealand as an essential element in understanding world geography. One of the most important records of the exploration of the southern Pacific Ocean, *Polus Antarcticus* was the first map of the Antarctic area designed to incorporate discoveries in the southern polar region. An odd mix of early myths about a southern continent and the latest discoveries, it was originally published by the Dutch master-engraver Henricus Hondius (1597-1651) of Amsterdam in 1636. As a document, the map catalogued the Dutch encounters with the Australian continent, culminating in the voyages of Abel Jansz. Tasman.

As shown above, though no European mapped any part of the Antarctic landmass until the 1820s, a southern land called 'Antarctica' first appeared on a world map drawn by Francesco Rosselli and printed in Florence in 1508. World maps centered on the poles emerged as early as 1531, with the seemingly prescient heart-shaped projection by Oronce Fine, *Nova, et integra universi orbis descriptio* [A new and complete map of the whole world]. By the time Hondius produced his map a century later, only vestiges of ' *Terra Australis Incognita*' remained, and the south polar circle was left empty.



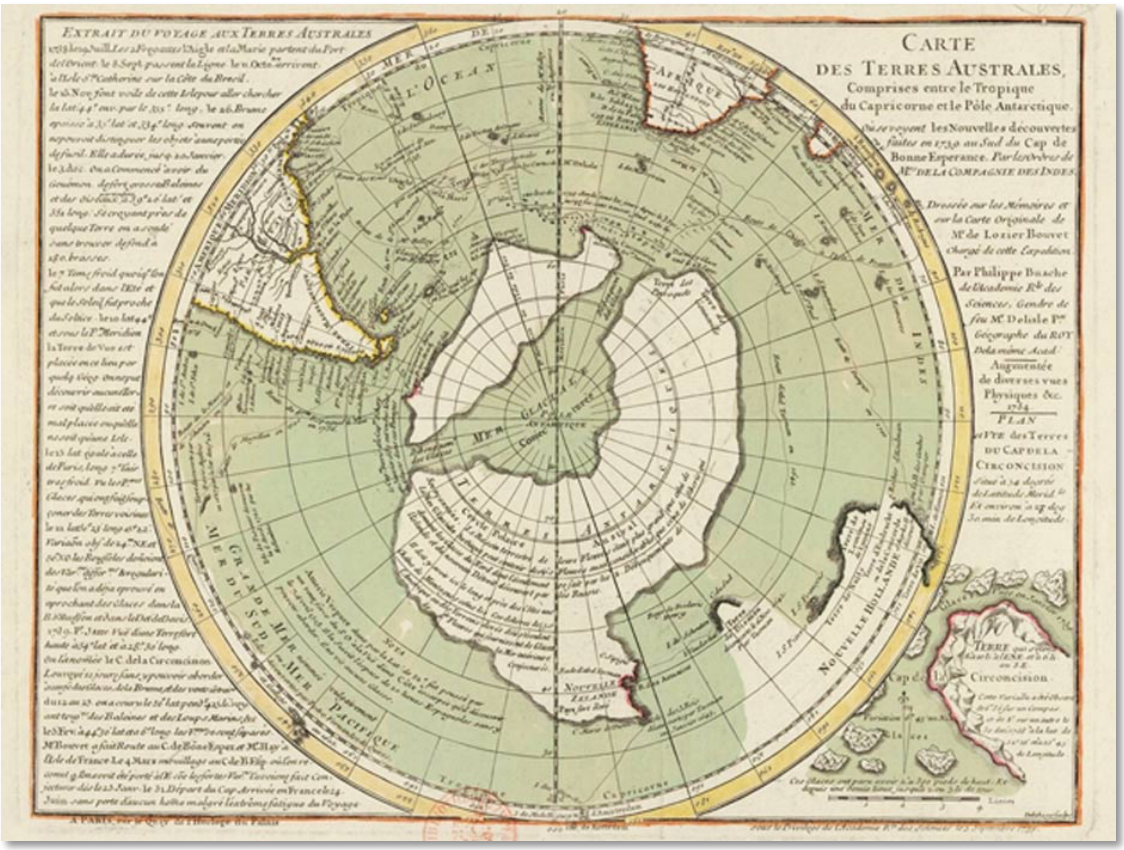
Shibukawa Harumi's Terrestrial Globe, 1695, 24 cm diameter,
Jingu Historical Museum, Ise, Japan

While *Terra Australis* was very much a diminished version of the Mercatorian archetype, and while interest would never again reach the fever pitch of the preceding century of activity, the Pacific generally and *Terra Australis* in particular continued to exercise the imaginations of not just novelists, but scholars, entrepreneurs and mariners.

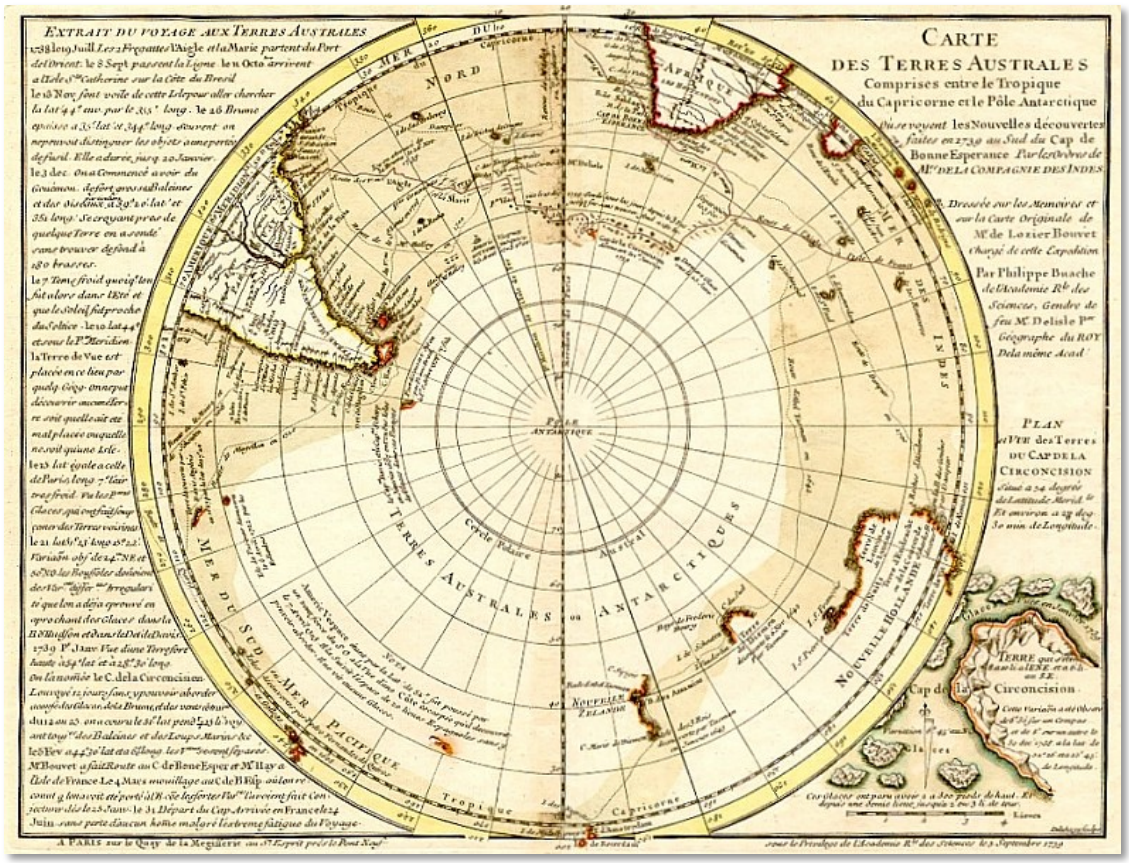
Whatever may have been the expressed motives of the next century and a half, or more, of exploration of the Pacific-the Dutch in the Indies and on the coast of Australia, the English and Dutch buccaneers on all the coasts, the French with their

great *Compagnie des lndes Orientales*-there seems never to have been far from the minds of the leaders and projectors the discovery of the great continent of the south. The romance of unexplored regions and undiscovered geographies was no match for cold pragmatism. Exploration for the southern continent just did not meet the commercial imperatives driving the decision-making of companies and states alike. Though the Age of Discovery had not yet run its course, this period— the late 17th and early 18th centuries—was the lowest point for maritime exploration.

In the 18th century most world maps did not depict a southern continent, but many did contribute to the continued belief in such an entity through their annotation of the Antarctic latitudes with the label *Terres Australes* or *Terres Antarctiques*, or similar.



This map was named after its creator Philippe Buache who made the map on September 3, 1739. The full title of the map is " Carte des Terres Australes comprises entre le Tropique du Capricorne et le Pôle Antarctique où se voyent les nouvelles découvertes faites en 1739 au Sud du Cap de Bonne Esperance," which in English translates to "Map of the Southern Lands contained between the Tropic of Capricorn and the Antarctic Pole, where the new discoveries made in 1739 to the south of the Cape of Good Hope may be seen." The Buache map appears in two versions. One of the charts is believed to accurately depict the ice-free coastline of Antarctica while the other chart makes no mention of the continent whatsoever.



Buache's 1739 map is complete, and clearly depicts the Southern Hemisphere. A large landmass fills the center of the map, divided into two halves by a channel and sea, while the southern peninsula's of South America and Africa are visible, as is the southern coast of Australia. The map contains considerable annotation. Buache's heading describes the area depicted: "MAP OF THE SOUTHERN LANDS, encompassing the area between the Tropic of Capricorn and the Antarctic Pole, where one sees the new discoveries in 1739 south of the Cape of Good Hope." The question of accuracy is particularly straightforward; New Zealand is shown as part of the larger landmass, a clear inaccuracy. However, notes on the map render any claims of sub-glacial geography moot, because Buache states that the map is a composite taken from the accounts of sailors who had scouted the ice-cap.

The right hand side of the map contains an account of this expedition that mentions icebergs. Indeed, you don't even need to translate the document to see that icebergs have been illustrated on the map, but if you do, Buache has provided descriptions of their size. This is clearly not an ice-free Antarctica. Buache's annotations are very honest - he never claims the map is accurate, even writing "Conjecture" on some of the features. They document the concerted effort European sailors were making to explore, and map, the Antarctic regions in the 1730's. Bouvet is recognized as a pioneer in Antarctic exploration, and on his voyage of 1738-9, documented on Buache's map, he discovered an island that still bears his name. The discoveries of Yves Kerguelen de Trémarec, and James Cook, followed Bouvet several decades later. Buache has added the route of Abel Tasman, whose name has been given to Tasmania.

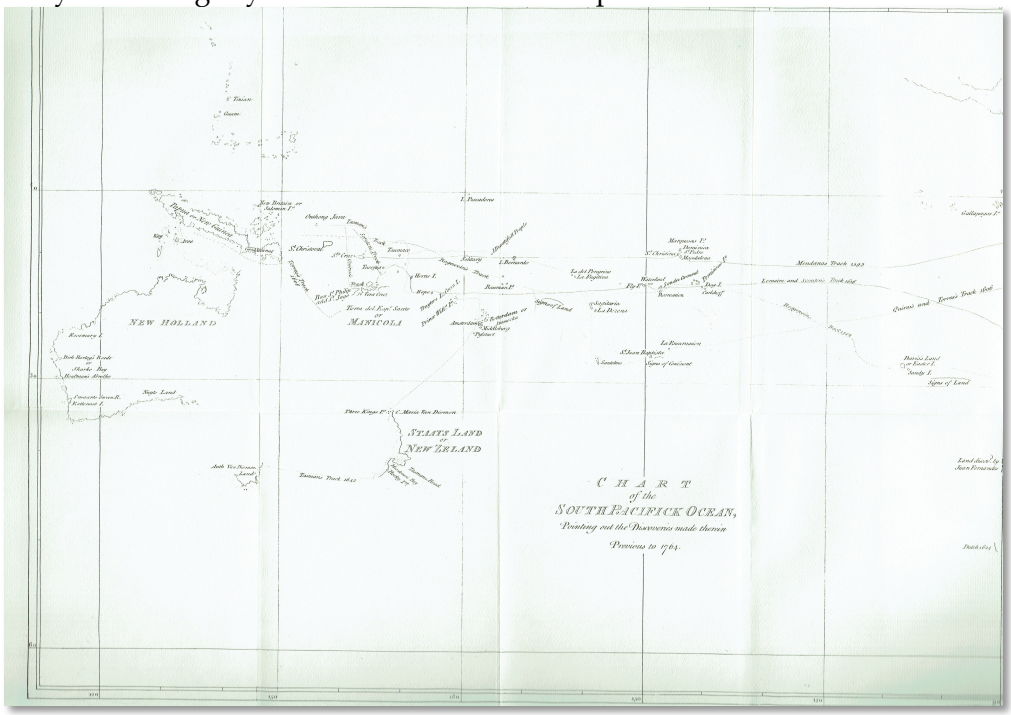
The general accuracy of the map is easy to determine: New Zealand is shown as a peninsula of the Antarctic landmass, an obvious error. This mistaken deduction was based on Abel Tasman's report of his position when he entered the Bay of Assassins and the nearby Isle of the Three Kings, which he discovered in January 1643. Buache simply drew a line between Tasman's stated position and the land spotted south of the ice floes seen some distance to the south, assuming it all to be land. Buache's (or, rather, Bouvet's) *Cap de la Circoncision* is now known not to be a cape at all but an isolated island – Bouvet Island – not connected with Antarctica.

Buache's map of 1739 is a combination of three basic factors. European explorers and geographers had been convinced for many years that a great southern continent existed, and representations are present on many maps; it would have been unusual not to find one on Buache's. Secondly, the 1739 map illustrates a procedure that Buache followed for much of his life - charting and understanding the first-hand reports of sailors. Finally, the map reveals the early stage of one of Buache's conclusions. In 1763 the *Gentleman's Magazine*, a journal famous in the 18th century, published "Geographical and Physical Observations, including a Theory of the Antarctic Regions, and the frozen Sea which they are supposed to contain, according to the Hypothesis of the celebrated M. Buache". In this article Buache explained his ideas, that in order to produce huge icebergs the southern pole must contain a frozen sea, fed by vast mountain ranges and rivers. The large central basin shown on his 1739 map is a precursor to this idea.

What all of these maps and globes that display a large landmass at the South Pole have in common is a reasonably accurate characterization of Antarctica centuries before it was even sighted, let alone mapped.

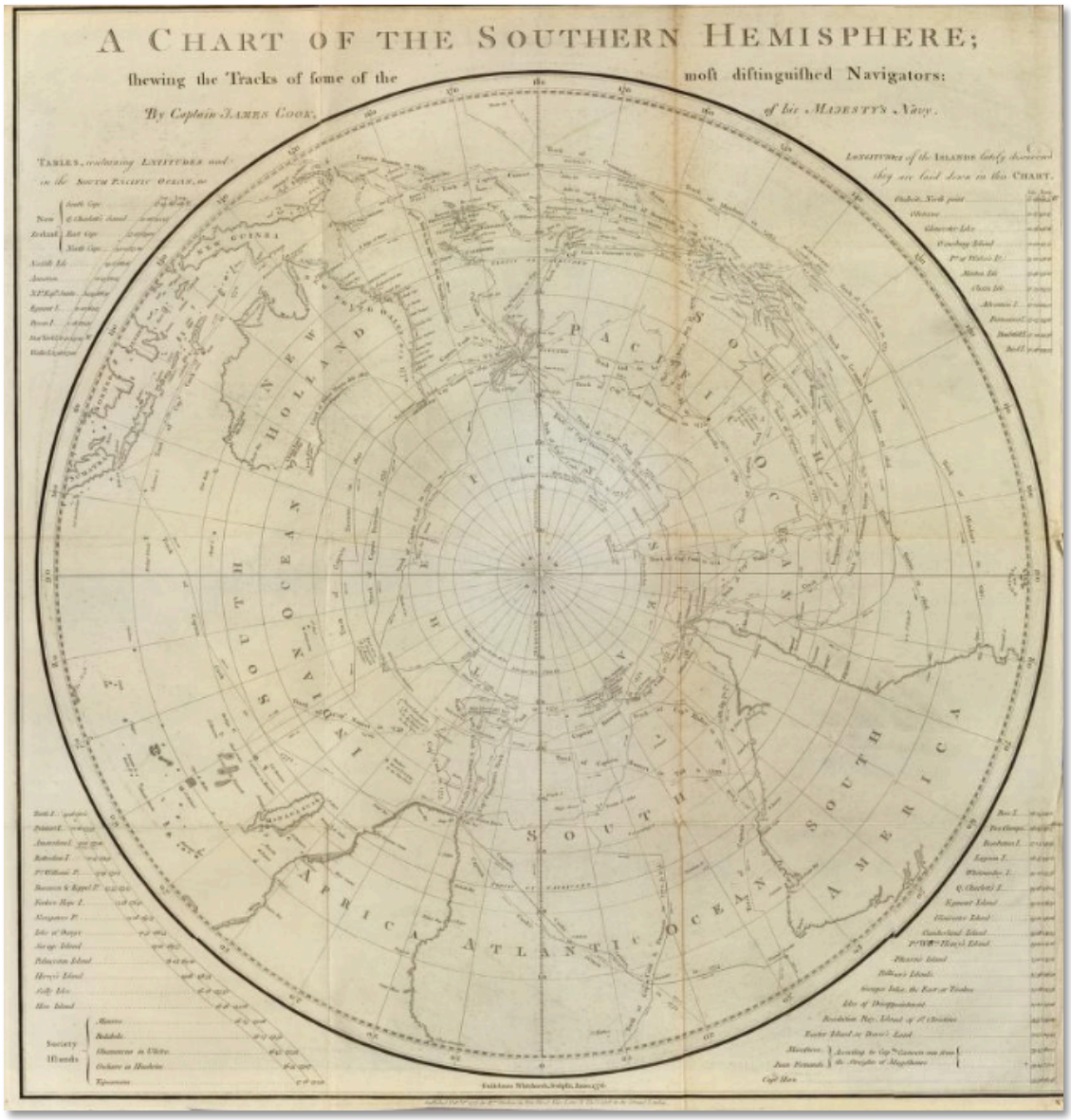
The search for the continent that did not exist, at least in the form in which it had been envisaged, presents throughout its course a moving scene in the *comedie humaine*. Hardship, death, disappointment had been its components for centuries of endeavor. Its closing scene was not unworthy of what had gone before. In 1768 Lieutenant James Cook of the Royal Navy was ordered to Tahiti in command of an expedition to observe the Transit of Venus that was to occur in the following year. That event of cosmic magnitude drew the astronomers and mathematicians of all countries forth from their studies and sent them to chosen stations throughout the world to record the attendant phenomena. Alexander Dalrymple, a young man in the service of the East India Company, who had already established some degree of reputation as geographer and traveler, felt that the command of this expedition should have gone to him rather than to a middle-aged naval lieutenant known theretofore only for a survey of the Newfoundland coasts in the course of which he had recorded the eclipse of the sun in 1766. Dalrymple had published in 1767 a map of the South Pacific upon which he had shown the tracks of voyages made in that sea before 1764, and had indicated by a legend the "Tierra del Esp," Santo or Manicola," claimed by Quiros to be the northern extremity of the southern continent (No. 99). This map accompanied his book of that year, *An Account of the Discoveries made in the South Pacifick Ocean Previous to 1764.* The purpose of the book and map was to set forth Dalrymple's grounds for belief in the southern continent. While Cook was in the midst of the first of the great voyages (1768-1771) which gave him fame as navigator and explorer, Dalrymple published in 1770 and 1771 a more ambitious work, embodying the map of 1767 and a history of Spanish and Dutch voyages in the South Pacific. *An Historical Collection of the several Voyages and Discoveries in the South Pacific*

Ocean was the affirmation of a settled faith in the existence of the austral continent. Its author should have been warned of coming events when in 1769 Bougainville, returned from conducting the first French expedition to circumnavigate the globe, reported that the *Austrian Land of the Holy Spirit,* which Pedro Fernandez de Quiros had assumed to be the continental land of the south, was in fact a group of islands which he himself had explored and to which he had given the name *L' Archipel des Grandes Cyclades*. That discovery, however, was only a minor blow to the cause of which Dalrymple had made himself the champion. Cook returned to England in 1771 with the log of a voyage southward from Tahiti over open sea in areas where Dalrymple supposed land to lie. Furthermore, he had circumnavigated New Zealand, thought by its discoverer, Tasman, to be part of the southern continent. He had coasted the eastern shores of Australia and sailed through Torres Strait, thus completing proof that Australia and New Guinea were islands detached from a continental landmass. These explorations erased from the maps and from most men's minds the portion of the southern continent that was supposed to lie between the west coast of South America and New Guinea. Dalrymple's contention thereafter was that another great northward extension of the continent would be found in the Atlantic between Cape Horn and the Cape of Good Hope. Here was the projection from the southern continent which in the Ortelius world map of 1587 ran northwards to almost 40° S latitude. Curiously this *Prom. Terre Australis*, as Ortelius designates it, is portrayed forthrightly in that Turkish world map of 1730.



Dalrymple's Chart of the South Pacific Ocean, pointing out the discoveries made previous to 1764/ On his chart he marked the tracks of all the key navigators including Mendana, Quiros, Torres, Roggeveen, and Lemaire and Schouten, and based his chart on a thorough re-examination of their discoveries. He set out discoveries made by the Dutch in the Duyfken along the Gulf of Carpentaria, by the Leeuwin on the south-west coast of Australia, and by Tasman along the southern coast of Tasmania.

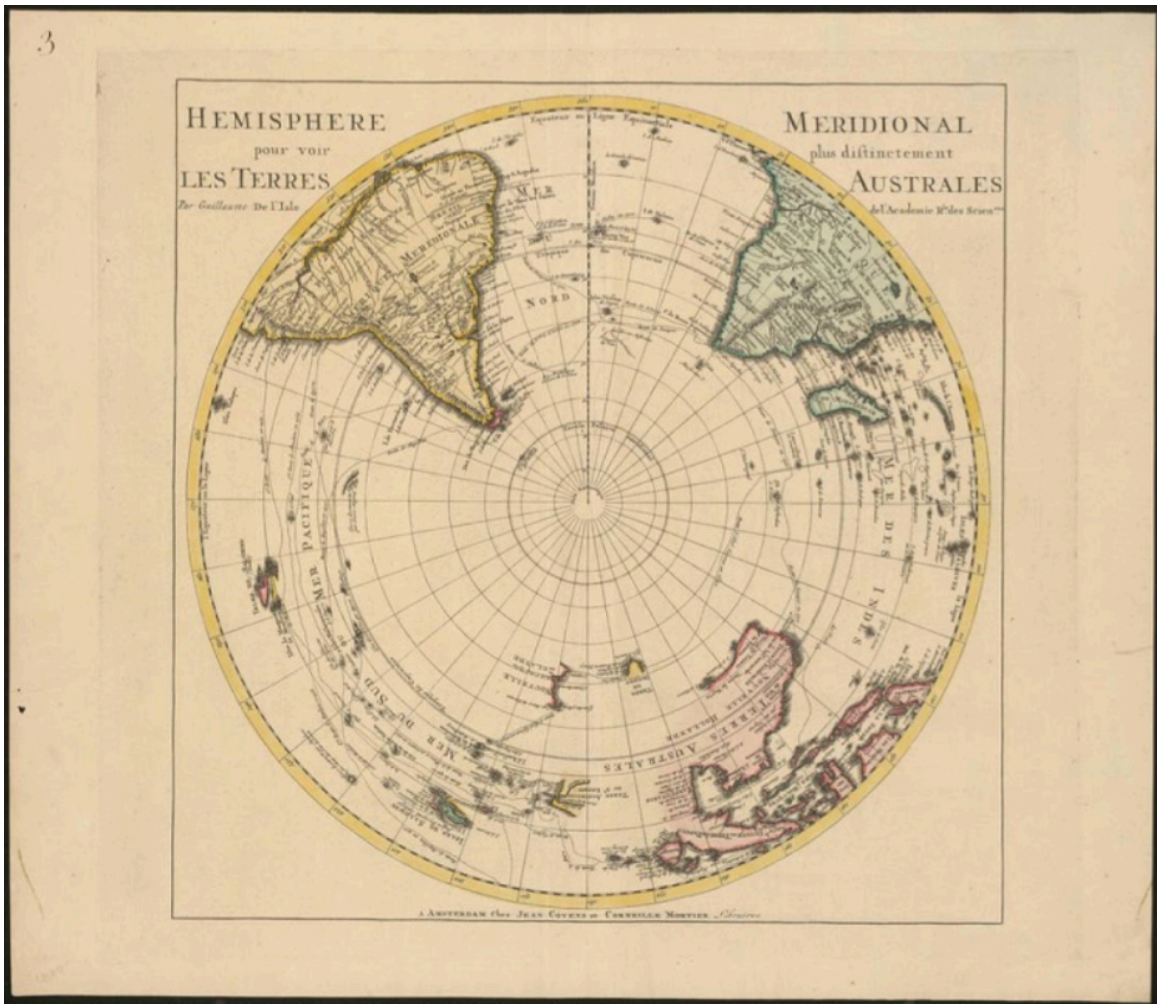
The refutation of his theories was not gracefully accepted by Dalrymple who, like so many before him, believed firmly that a southern landmass was a logical necessity, an essential element in the maintenance of the equilibrium necessary to the motion of the earth. While Dalrymple was engaging in a pamphlet controversy with Cook's editor, Hawkesworth, on the veracity of the Cook report of the 1768 voyage, the great navigator sailed away on his second voyage, exploring in the course of it the higher south latitudes of the Indian, Pacific, and Atlantic Oceans, demonstrating the absence of land in the South Atlantic where for centuries it had been supposed to exist and where Dalrymple had proposed to settle a colony. Once more the principle of personal reconnaissance had won the day; the theoretical had fallen before the practical. Dalrymple's theories were buried under the accumulation of exact data displayed in Cook's *A Chart of the Southern Hemisphere*, published in 1777 and found normally in Cook's *A Voyage towards the South Pole* of that year *(shown below).*



This original first edition, copper-plate engraved, antique map, a chart of the Southern Hemisphere, was engraved by William Whitchurch in 1776 - dated - and is dedicated to the discoveries in the South Seas and Antarctic Regions of Captain James Cook during his second Voyage of Discovery between 1772 & 1775. By comparison the tracks of 11 other explorers are included, from the 16th to the 18th centuries. The map by Captain James Cook was published in the 1777 edition of *A voyage towards the South Pole, and round the World. Performed in His Majestys ships the Resolution and Adventure, in the years 1772, 1773, 1774, and 1775.published by William Strahan, New Street, Shoe Lane, & Thos. Cadell, in the Strand, London 1777.* The 11 other explorers and their tracks around the Southern Hemisphere are;

1. Mendana in 1595
2. Quiros in 1606
3. Le Maire & Schouten in 1616
4. Tasman in 1642
5. Halley in 1700
6. Roggewein in 1722
7. Bouvet in 1738-39
8. Byron in 1765
9. Wallis in 1767
10. Bougainville in 1768
11. Surville in 1769
12. Cooks first and second voyages.

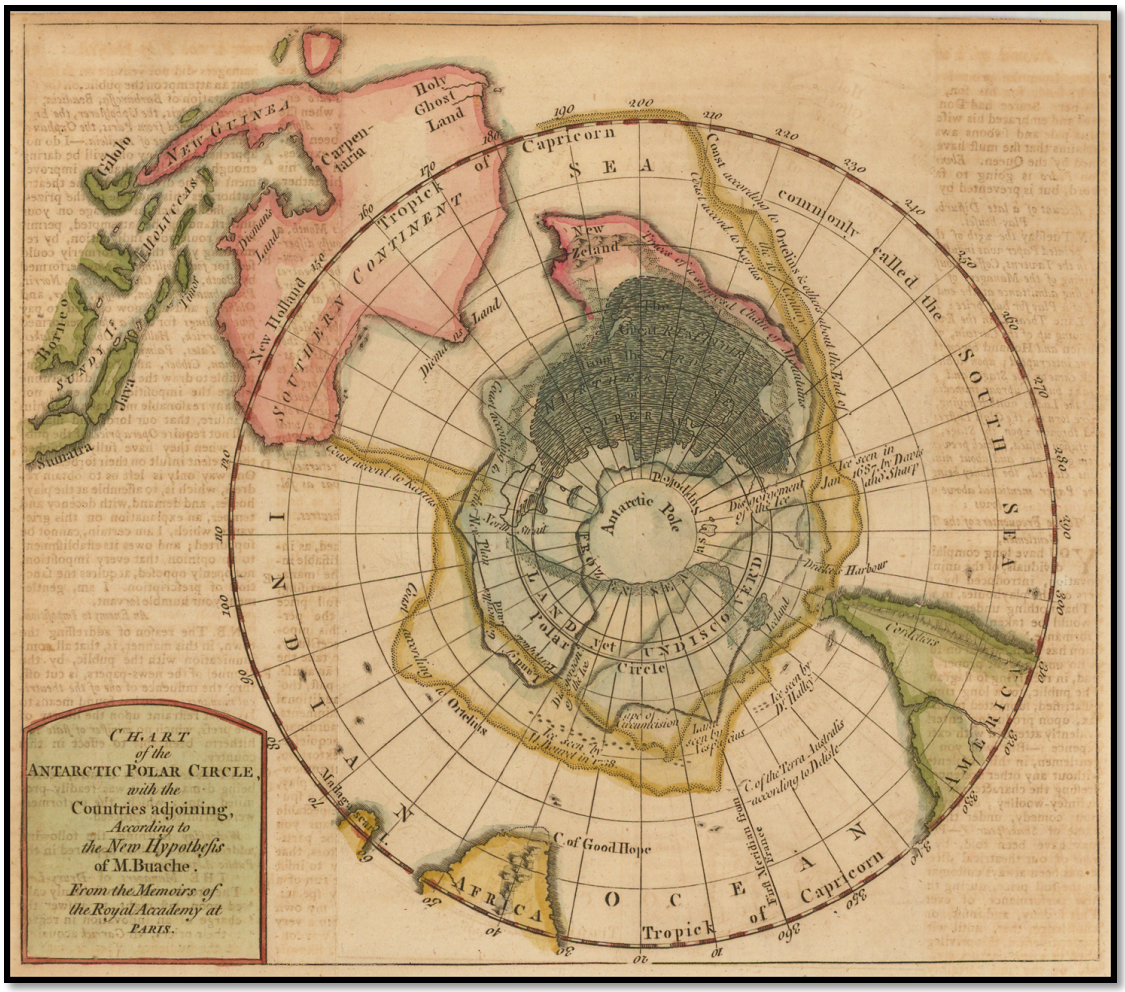
But despite Cook's destruction of the theory of a *Terra Australis* as conceived by the geographers the story was not thereby fully told. The true Antarctic continent refused to be ignored. Cook, indeed, made no effort to ignore it. On the contrary he who destroyed the old theory immediately substituted for it the postulate that land must exist at the South Pole to serve as the matrix of the fields of ice found in the Antarctic area. We know today that the grounds of the assumption were erroneous, but we know also that a continent was there all the time far beyond the latitudes in which formerly it was supposed to lie, the continent we know as Antarctica, a cozy piece of land, one-third as large again as the continent of Europe. Postulated in the 18th century by Cook, roughly surveyed and outlined in the 19th by Wilkes and Ross, it was penetrated deeply in the 20th by Scott, Shackleton, Amundsen, and Byrd, doughty men striving to remove the term "incognita" from its earlier designation. Long before that time the vast and indefinitely outlined province of *Beach*, had slowly become the solid fact we know as the continent of Australia.



1741: Covens & Mortier and the vanishing Australis

By the 18th century, the Dutch cartographical golden age produced a number of enormous (and enormously successful) map publishers. One of the largest was Covens & Mortier, founded in Amsterdam by Johannes Covens and Cornelius Mortier. Among their long tradition of impeccably drawn maps was a rendering of the Southern Hemisphere that does not depict *Terra Australis* at all. This was a common result of further [unsuccessful?] exploration into the southern seas: As navigators began to learn how far the seas extended to the south, the available room for the once-colossal *Terra Australis* naturally diminished.

In fact, explorations undertaken in the previous century had already disproved much of the hypothetical southern continent's dimensions. Tierra del Fuego, for example, was revealed as being smaller than originally thought, and Australia was found to not be part of a larger southern continent. In 1770, James Cook continued this reduction by showing that New Zealand was also not part of *Terra Australis*, which he deduced must be located within the polar region of the Southern Hemisphere.



This is a fascinating (and entirely speculative) map of the Antarctic Regions, based upon the map of Philippe Buache, published in Paris. The map is perhaps most notable for the renewed speculation regarding lands of the southern polar regions. Still entirely undiscovered, French mapmakers had taken a renewed interest in the prospects of the lands of the unknown southern continent in the middle part of the 18th century. For example, the present map shows *Terre de Goneville*, a reference to the discovery of Antarctica by a French explorer named Gonneville in 1504. The French explorer Captain Binot Paulmyer de Gonneville claimed to have discovered the southern continent in 1504. He stayed six months and found the natives “asked nothing but to lead a life of contentment, without work.” He brought back skins, ornaments, and an Indian prince named Essomeric. Historians believe that Gonneville was probably in southern Brazil.

In the interior of the imagined southern continent, Buache postualates a large Antarctic Sea, which was inspired in part by the 1738-9 expedition of Bouvet de Lozier, which mentions the discovery of icebergs between two and three hundred feet high and half a league to two or three leagues in circumference. Buache placed Bouvet’s *Cap de la Circoncision* at 54° south, below Africa, a northern promontory of the smaller of his two land masses, next to one of the openings of his polar sea, where Bouvet had recorded his many great icebergs. Buache also shows the route of the voyage of Abel Tasman (1603-1659) in 1642-3 as a source for information about the

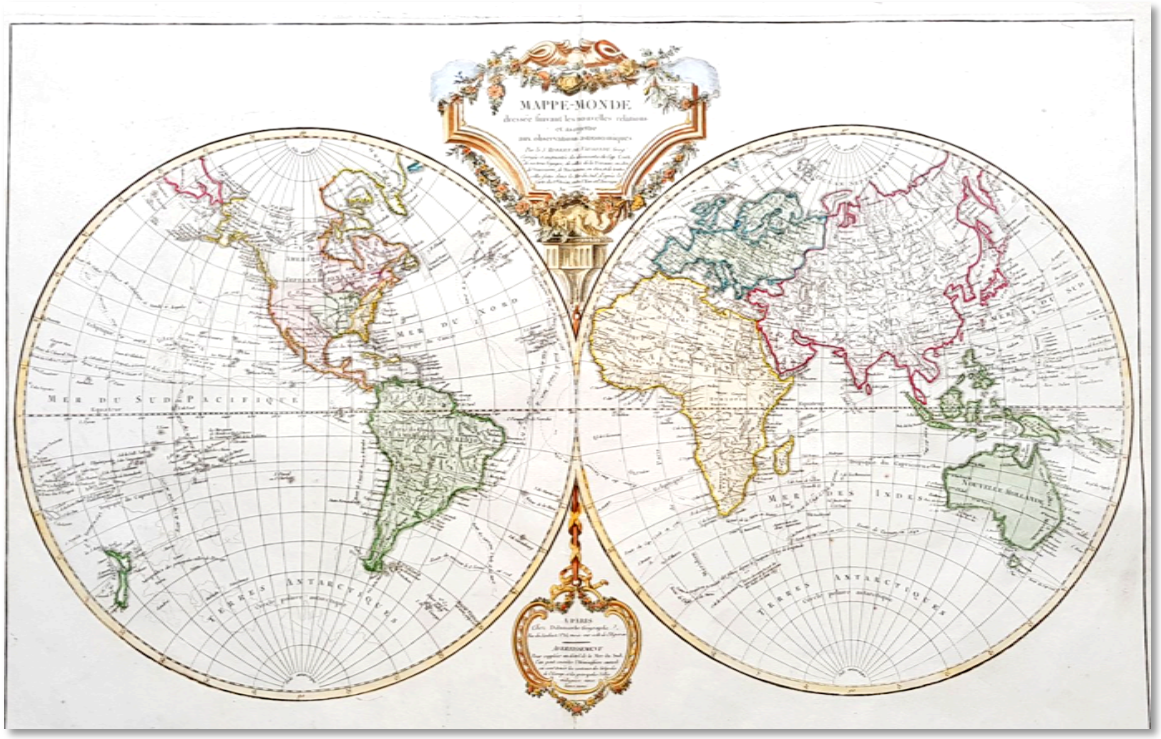
southern lands. Buache believed that the icebergs must have derived from a floating ice sheet, as in the Arctic, rather than from the newly discovered land. This led him to conclude that the southern continent was not a single landmass but two islands separated by a frozen inland sea, from which icebergs detached themselves to float northwards.

The sea shown in the center of Antarctica was based upon a hypothesis Buache had developed over a number of years. His paper "Geographical and physical observations, including a theory of the Antarctic regions and the frozen sea which they are supposed to contain" was published by *The Gentleman's Magazine* in 1763. In it, he hypothesized that the southern pole must contain a frozen sea, fed by mountain ranges and huge rivers, in order to produce icebergs of the size reported by Bouvet; the large sea, *Mer Glacial* [Glacial Sea] depicted on the 1739 map is an early version of this hypothesis.

Buache was an academic geographer who researched his material thoroughly, relying on the most up-to-date information from voyages of discovery. He was the first geographer to recognize the important concept of the watershed and it was this that led him to make a number of deductions, some correct, some not. A correct deduction was the existence of Alaska and the Bering Strait, years before they were officially discovered, while an incorrect deduction was the existence of a central Antarctic sea, which he conjectured to be the source of the icebergs observed by Bouvet in 1738-39. There are those, including Hapgood, who saw Buache's map as a tie in to the *Piri Reis* map in the argument that these maps depict a sub-glacial landmass that is the Antarctic.

Antarctica reflects a belief in a geography that does not exist: people set out to discover it, only to find it is not there. Yet from the 16th through 18th centuries, people kept on believing anyway, despite coasts of the southern continent being sailed through and disproved time and time again. Until the voyages of James Cook, there was no amount of damage that could be done to the imaginary southern continent sufficient to stop people believing.

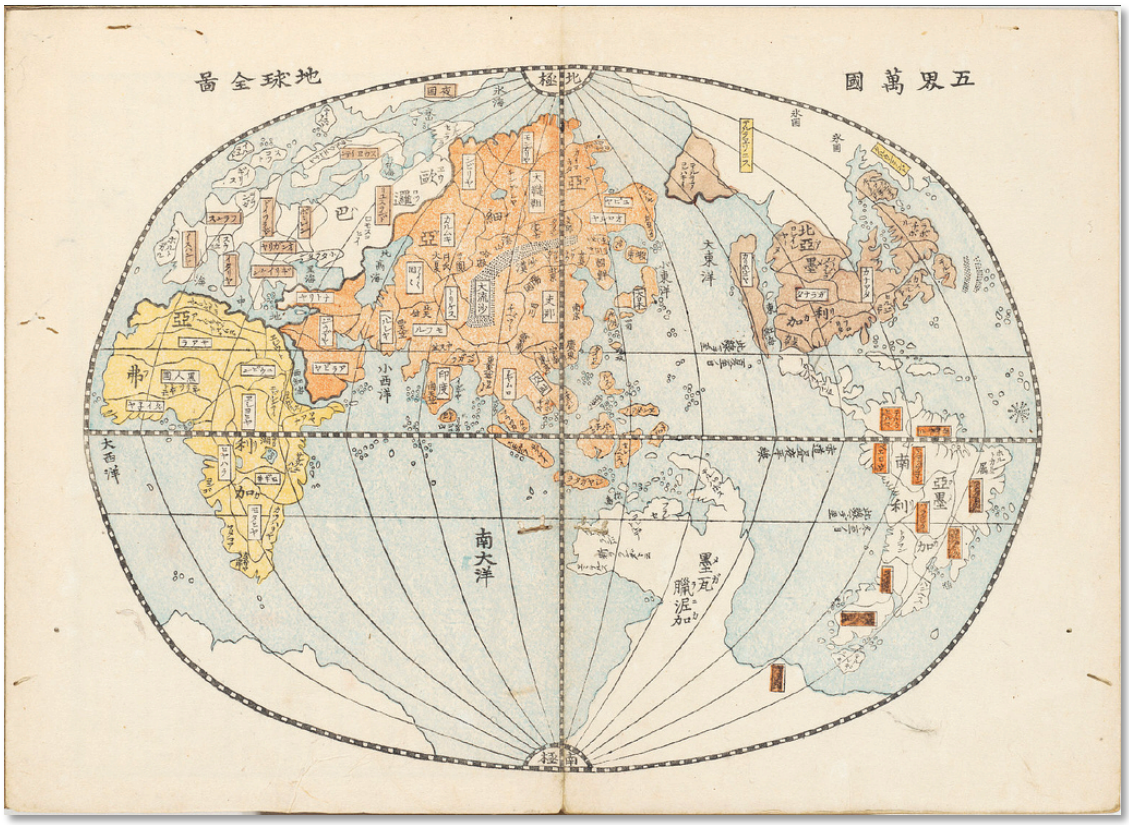
Why did people believe, and why did people continue believing, in a great southern continent? At the heart of it all is a simple proposition. People believed in the southern continent because they wanted it to be real—it was a geography worth believing in. People then continued to believe in the southern continent in the face of overwhelming proof of its non-existence because authorities on the matter had always taught that it was real, and people still wanted it to be so.



1816: Du Vaugondy's Mappe-Monde

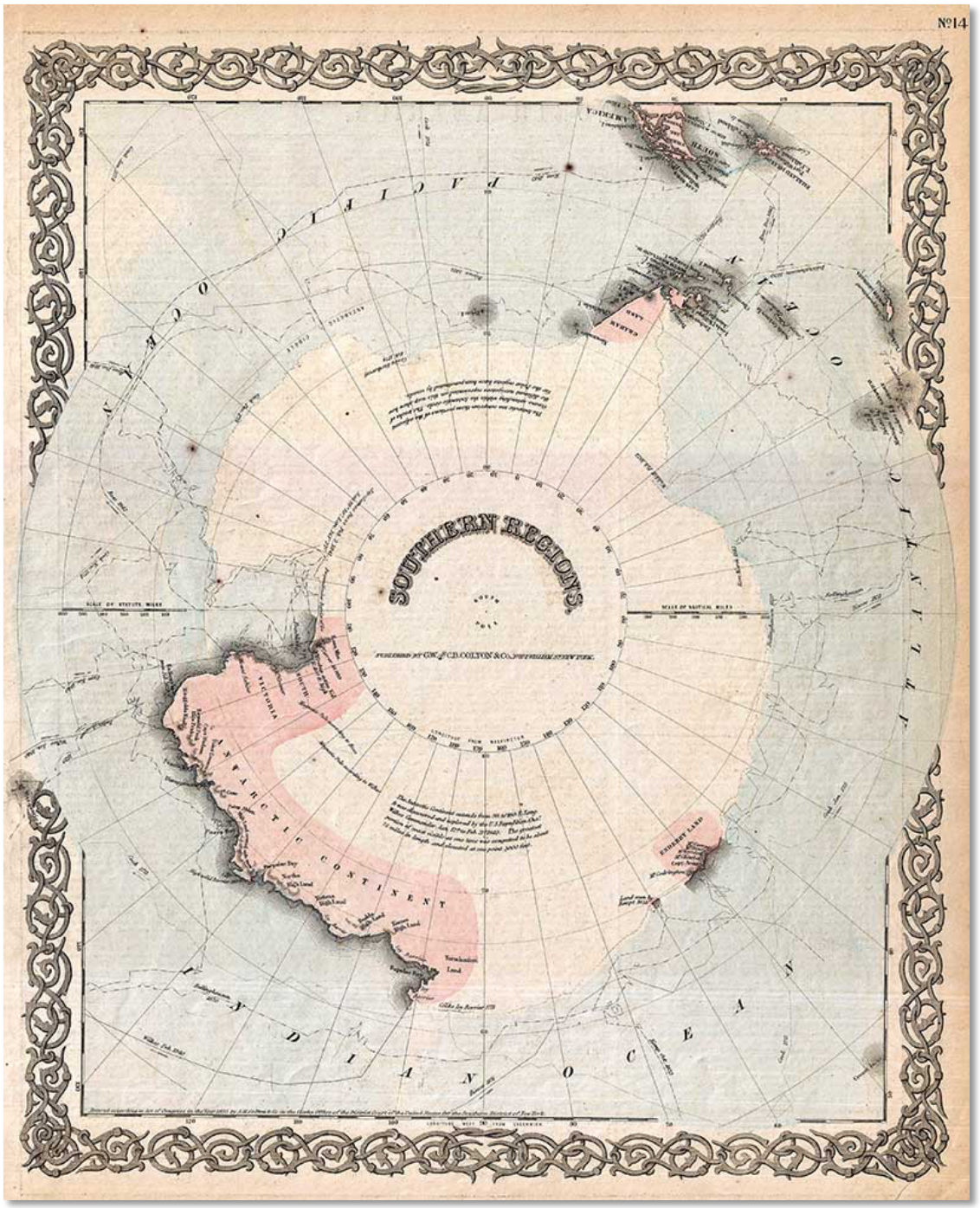
Gilles and his son, Didier, two of the 18th century's most well-known French cartographers, produced some of the last maps to predate the confirmed 1820 sighting of Antarctica. One of their most extensive maps, the 1749 *Mappe-Monde*, also omits *Terra Australis*. The landmass is replaced with the unknown area of *Terres Antarctiques*, translating simply to "Antarctic Lands." The version of the Vaugondy map shown above, which is in this image, was released in 1816 and includes updates resulting from the discoveries of multiple explorers after the original 1749 release.

Other parts of the world are nearly as blank as the Antarctic region, such as America's Pacific Northwest. It would be some time before this area would be filled in, much like Antarctica, but if nothing else these blank portions suggest that cartography was moving away from its reliance and incorporation of ancient conjecture. The system and science of mapmaking, advancing all the more rapidly with the innovations spurred by the Age of Discovery, would in turn progress map-by-map toward the state we find it in today.



Dai Nihon yochi benran, Giko Yamazaki, Tenpo 5, 1834
Note the long island off the west cost of North America (California?)

This map is part of a woodblock atlas that begins with a map of Japan, which is followed by maps of the individual provinces, and finally a map of the world, This map makes clear the effects on geographic knowledge of Japan's long closure to outside influence: California is still being mapped as an island and Australia (marked *vnegarantka* presumably relating to the color of the inhabitants) is joined to New Guinea to the north and to Antarctica at the south examples of outdated geographical knowledge, New Zealand does not appear on the map.



Colton's 1872 map of the South Pole, Antarctica, or the Southern Polar Regions. This old map of Antarctica shows the great southern continent with both solid and tentatively sketched in borders. The map also notes the travels of important Antarctic explorers of the previous 20 years or so, including Wilkes (1840), Bellinghausen (1820), Ross (1840 – 1843), Klempt (1833), Cook (1773 – 1774) and Biscoe (1831). The map generally gives an excellent overview of the state Antarctic exploration and discovery to about 1855.

Map of Byrd Second Antarctic Expedition, 1934

Rear Admiral Richard Byrd was an American naval officer and explorer. On his second expedition in 1934, Byrd spent five winter months alone operating a meteorological station, Advance Base. This expedition is described by Byrd in his autobiography Alone. It is also commemorated in a U.S. postage stamp issued at the time, and a considerable amount of mail using it was sent from Byrd's base at Little America.

The word "desert" tends to evoke images of extreme heat, cacti, and vast expanses of sand. The technical definition is less fanciful: an area that receives no more than 25 cm [10 inches] of precipitation per year. With that in mind, it's perhaps less surprising that Antarctica is the world's largest desert. At 5.5 million square miles, it edges out both the Arctic (5.4 million square miles) and Sahara (3.5 million) deserts, with the Arabian and Gobi deserts rounding out the top five. Antarctica only receives about 6.5 inches of precipitation in a given year, almost all of it as snow.

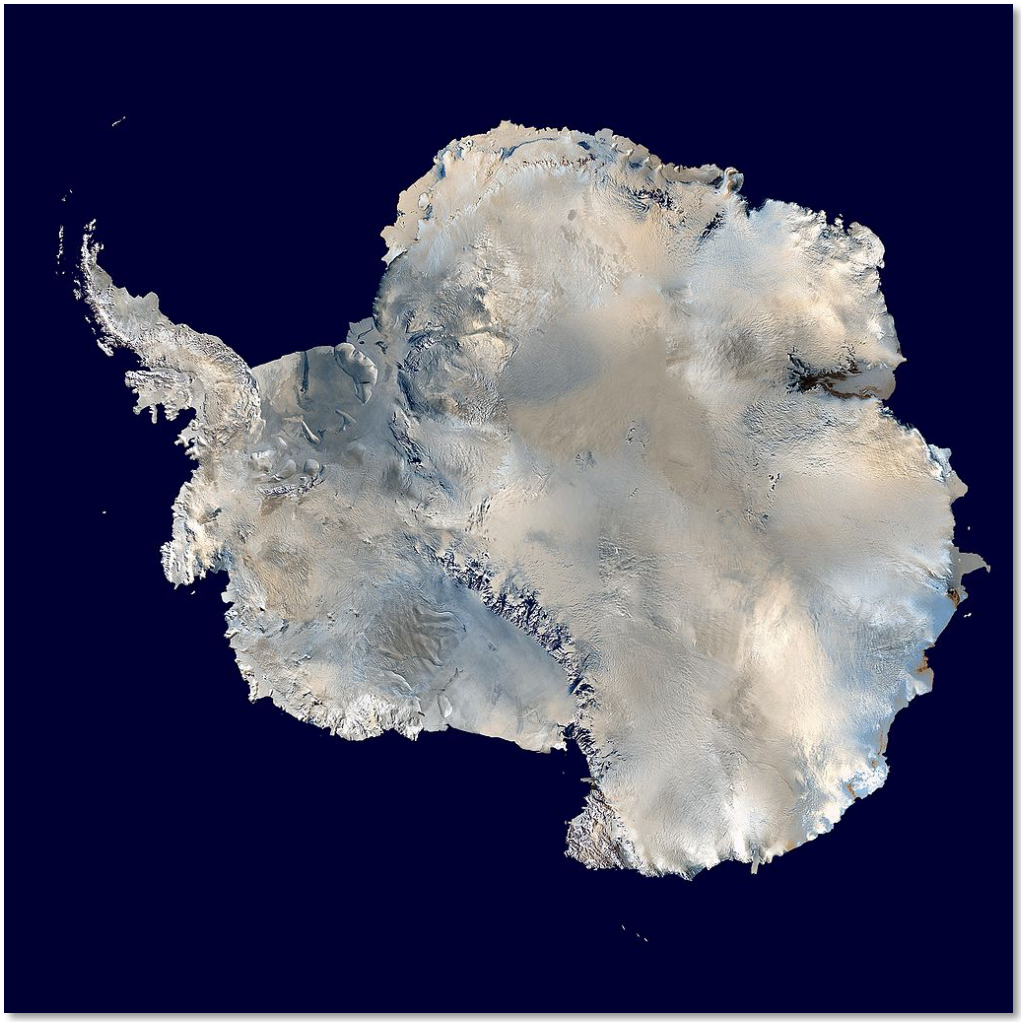
Antarctica is a land of extremes, and it ranks first among the seven continents on several scales. In addition to being the coldest continent, it's also the windiest, driest, and highest one. The coldest Antarctic temperature (and thus the coldest on Earth) was recorded at Vostok Station in July 1983 at -128.6°F. The highest wind speed recorded on the continent was at the Dumont d'Urville station in July 1972 at 199 mph. The average elevation is 8,200 feet — by comparison, the average elevation in the U.S. is a measly 2,500 feet.

Though most map projections don't convey it very well, Antarctica is big — really big. With an area of 5.4 million square miles, it's both the fifth-largest continent

(ranking ahead of both Europe and Australia) by size and roughly one-and-a-half times the size of the United States.

Long before a human set foot on Antarctica, explorers were obsessed with learning more about the Antarctic Circle. The circle was first crossed in 1773 by Captain James Cook, but it took another 47 years before Antarctica was actually seen by human eyes. The question of who can actually lay claim to that achievement remains disputed more than 200 years later, with Russian explorer Fabian Gottlieb von Bellingshausen reporting having seen "an ice shore of extreme height" on January 27, 1820 and Edward Bransfield of the Royal Navy describing "high mountains covered with snow" on January 30 of the same year.

What's known as the Heroic Age of Antarctic Exploration wouldn't begin until the end of the 19th century, with Norwegian explorer Roald Amundsen and his team first reaching the South Pole on December 14, 1911 — a feat matched just five weeks later by Brit Robert Falcon Scott.



An orthographic projection of NASA's Blue Marble data set (1 km resolution global satellite composite). MODIS observations of polar sea ice were combined with observations of Antarctica made by the National Oceanic and Atmospheric Administration's AVHRR sensor – the Advanced Very High Resolution Radiometer. This image was generated using a custom C program for handling the Blue Marble files, with orthographic projection formulas

from MathWorld. Note: this image has been manually modified to fill in an area of black pixels in the ocean, in the upper right quadrant. The black pixels are presumed to be due to missing data in the land/sea mask used in making the original Blue Marble image.

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